ABN 20 009 454 111

Qualeng

Review Report

Horizon Power Electricity Licence Asset Management Review

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executive summary

The Asset Management System Review was conducted in order to assess Horizon Power's level of compliance with the conditions of its licence.

Horizon Power have an Electricity Integrated Regional Licence (EIRL2 Licence) [the Licence] issued by the Economic Regulation Authority [the Authority] under Sections 7 and 15(2) of the Electricity Industry Act 2004 (WA) [the Act].

Section 14 of the Act requires Horizon Power to provide the Authority with a report by an independent expert on the effectiveness of their Asset Management System. In January 2009 the Authority notified Horizon Power that corrective actions were required by 30 September 2009 to address contraventions identified in the previous review.

In August 2009 Horizon Power commissioned Qualeng to carry out the Asset Management System review for the period between 1 April 2008 and 30 September 2009. The review has been conducted and this report prepared in accordance with the Authority's "Audit Guidelines: Electricity, Gas and Water Licences (July 2009)".

Horizon Power supply electricity and electricity services across 34 townships that are isolated from the South West Interconnected System (SWIS). These extend from the Kimberley in the North to Esperance in the South, 5 remote Aboriginal communities and the North West Interconnected System (NWIS). In addition to their own power generating plant in Carnarvon, Marble Bar, Nullagine, Kununurra and Wyndham, Horizon Power also purchase electricity from third parties.

Horizon Power transmit and distribute electricity to both residential and commercial customers. The transmission system, the NWIS is about 450km in length and consists of the transmission line between Dampier in the West Pilbara to Goldsworthy in the East Pilbara with ring systems in Karratha and Port Hedland, with voltages up to 220kV. The distribution system is nearly 6000 km in length and comprises 6.6kV, 11kV, 22kV and 33kV systems.

The review was conducted through an initial document review followed by meetings with Horizon Power's management in the Bentley office. An audit/review plan, including a risk assessment of the asset management system controls, was developed by Qualeng in early September 2009 and approved by the Authority on 14 September 2009. The review continued with further meetings and interviews with key Horizon Power staff, both in the Bentley office and in the districts. A number of visits were carried out at the Licensee sites which included Karratha, Carnarvon, Kununurra, Wyndham and Esperance.

The evaluation of the system effectiveness was carried out through an assessment of the control environment, information system, control procedures, supporting documentation and compliance attitude.

The final report includes:

(i) a review of the objectives, the scope of the task, details and progress of actions

resulting from the previous review,

(ii) key findings and recommendations from this review and

(iii) a post review implementation plan listing the review recommendations and actions proposed by Horizon Power. Although this plan does not form part of the report, it is included to complete the documentation.

Summary Of Issues And Recommendations

The **Summary of Issues and Recommendations** is shown in Table 1 listing the issues that have resulted in recommendations that require corrective actions by the Licensee.

The summary follows the order of Asset Management System elements provided in the Authority guidelines. Some of the recommendations appear under more than one element, for example, findings on planning documents may appear under planning, information systems, maintenance, review etc. In the Post Review Implementation Plan, as far as practical, the recommendations have been combined into common entries so that no duplication of recommendations is created.

The **Post Review Implementation Plan**, was prepared by the Reviewer and completed by the Licensee in regard to actions, responsibility and date for completion. A copy of the plan is attached in Appendix D.

Table 1: Summary of Issues and Recommendations

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
1	**Asset Planning**				
1.1	Planning process and objectives reflect the needs of all the stake holders and is integrated with business planning	Planning studies for Hopetoun and Norseman were not carried out and were just overdue in Carnarvon and Kununurra / Wyndham. Carnarvon and Esperance Generation DAMPs were incomplete and need review/updating. DAMPs require better document and process control to ensure accuracy and completeness, consistent approval and control over timing.	B	2	▸ Review requirements for planning studies and prepare planning studies for Hopetoun, Norseman and other required localities. ▸ Complete Distribution planning studies for Carnarvon and Kununurra. ▸ Complete Carnarvon and Esperance Generation District Asset Management Plans (DAMPs). Missing data and follow-up actions need to be tracked. ▸ Improve control and ensure consistency across all planning documents such as DAMPs. Use document author, reviewer and approver consistently. ▸ Apply better version/revision control of DAMPs and control of review and issue cycle.
1.2	Service levels are defined.	Both quantitative and qualitative regulatory obligations are defined and monitored. Additional performance measures are developed as necessary to monitor assets. Some of the reported KPIs are below target.	A	2	▸ Continue with application of corrective action to minimise KPIs below target.
1.3	Non-asset options (eg. demand management) are considered.	While no formal or consistent procedure appeared to be defined evidence of individual approaches to demand side management was noted within the districts. Demand side management is currently in trial stages via a pilot project.	C	2	▸ Continue the demand side management trial leading to the development of guidance or methodology on the adopted approach.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
1.4	Lifecycle costs of owning and operating assets are assessed.	Lifecycle costs seem to be considered at a high level in business cases as required. Development is underway to develop a more comprehensive life cycle costing model.	B	2	▸ Complete development of life cycle costing model. Ensure consistent application of life cycle costing model across organisation.
1.7	Likelihood and consequences of asset failure are predicted.	A central risk register is maintained and updated as a result of periodic district risk workshops and other meetings. Various examples of risk assessment and application sighted during site visits. Some areas of CURA still in development and needing improvement.	A	2	▸ Improve quality control over CURA data (ensure due dates for actions are entered and maintained current).
1.8	Plans are regularly reviewed and updated.	Asset management plans are reviewed annually and driven by the need to seek govt. budget approval, however, there is currently no strict control on the due date for these reviews. Related planning studies such as the Distribution System Planning Studies (eg. Carnarvon and Kununurra) are overdue according to their intended update cycle. Review of planning documents during the site visits revealed that document control was inconsistent and/or not applied where expected. Evidence of incomplete and missing planning documents was also discovered.	B	3	▸ Document and monitor update cycles for all key planning documents within CURA or equivalent control environment. ▸ Consider a more robust document management system for version/revision control, document dissemination to stakeholders and general quality control. ▸ Consider improved verification of DAMPs to ensure accuracy, completeness and suitability for approval.
2	**Asset Creation and Acquisition**				

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
2.2	Evaluations include all life-cycle costs.	There is some evidence of life-cycle cost modelling in the examples of business cases reviewed, however, this could be made more transparent with a formal life cycle cost model for new acquisitions.	B	2	▸ Complete development of life cycle costing model. ▸ Ensure consistent application of life cycle costing model across organisation.
2.4	Commissioning tests are documented and completed.	Most projects had completion and final inspection signed off, however, on a number of projects this had not been done.	B	2	▸ Strengthen the consistency of project completion and/or final inspection sign-off in accordance with forms in use.
2.5	Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.	There is a central register (CURA) maintained and updated, recording all business obligations. A monthly governance report summarises and disseminates compliance progress. Training of relevant staff is being undertaken for certain obligations, but could be extended and better integrated with other training areas of the business.	A	2	▸ [**OFI**] There may be scope for extending and better integrating the governance training system with other training areas of HP leading to a centralised training system.
3	**Asset Disposal**				
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.	Poor performance is routinely evaluated and acted upon as part of the annual planning cycle. This was further verified during the site visits. There is a recent procedure for asset disposal documented, but less evidence of asset disposal in the asset management plans due to under-utilisation.	C	2	▸ Document policy and/or procedure for the treatment of under-utilised and/or poorly performing assets.
	Environmental Analysis				

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
4.2	Performance standards (availability of service, capacity continuity, emergency response, etc) are measured and achieved.	Balance scorecards are maintained to measure the key areas of business operations. There is room for improvement in meeting some of the benchmarks established as well as ensuring sufficient data is being received from IPPs to monitor compliance. Emergency response is not currently part of the KPI suite.	B	2	▸ Confirm sufficient data being received from all IPP sites to measure compliance and document/report formally IPP performance. Obtain documentation on IPP contingency plans. Consider use of non- conformance reports to deal with IPPs failures. ▸ **[OFI]** Investigate the feasibility of placing back to back responsibility on the IPPs in future Service Level Agreements for compliance with the regulatory requirements. ▸ **[OFI]** Consider adding contingency/emergency response measures to the balance scorecard.
4.4	Achievement of customer service levels.	It appears that overall, expected customer service levels are being achieved, however, for certain sub-systems (ie. feeders) improvement is possible. The last stakeholder satisfaction survey indicated that stakeholders were on average satisfied, despite some ratings being lower than the previous survey.	A	2	▸ Continue to ensure that performance benchmarks are being achieved or corrective actions are being raised as appropriate.
5	**Asset Operations**				
5.1	Operational policies and procedures are documented and linked to service levels required.	Operating guidelines and instruction manuals for plant were noted during the site visits, however, in one case (Wyndham PS) site manual was out of date. Procedures for operation at HPCC are in preparation. Procedure for verification of fault reports at the HPCC will need to be documented.	A	2	▸ Ensure site manuals are kept up to date. ▸ Continue with documentation of procedures for HPCC activities, including a procedure for the verification of fault reports.
5.3	Assets are documented in an Asset Register including	There is a suite of Distribution and Transmission systems comprising the 'Asset Register' – no one	B	3	▸ Complete measures to streamline and integrate various 'Asset Register' systems. ▸ Complete project to update data associated with asset age profiles.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	asset type, location, material, plans of components, an assessment of assets' physical / structural condition and accounting data.	system contains all requisite asset details. Although the asset information maintained appears comprehensive, the myriad of systems and reliance of key individuals and WP for support is not ideal. Some data, such as pole age is known to be inaccurate. HP are also aware of existence of other incorrect data in the Asset Register. While resources have been allocated to correct the records, the amount of incorrect data is significant and there may be a need to better quantify the task and resource requirements. There are already plans to streamline asset record keeping as well as improve the accuracy of the data.			▸ Continue and strengthen actions to verify the accuracy of the data entered in the asset registers.
5.5	Staff receive training commensurate to their responsibilities.	There are currently several areas of training responsibility and the coordination of records between corporate, skills and asset management training could be improved to increase clarity in the training records. There are already plans in place to consolidate training system and competency records. At Karratha Control Centre (HPCC) training attendance records were not available, training plans and needs were not documented and training packages were in preparation.	B	2	▸ Proceed with consolidation of training system and training records . ▸ Document training needs and program for HPCC staff. ▸ Record training attendance and competency requirements for staff in HPCC.
6	**Asset Maintenance**				
6.1	Maintenance policies and	HP possess quite a comprehensive suite of	A	2	▸ Consider improved verification of DAMPs to ensure accuracy, completeness and suitability prior to

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	procedures are documented and linked to service levels required.	maintenance procedures, many inherited from WP and some that could possibly be streamlined into fewer documents. DAMP review and site visits revealed that some of the maintenance data in the DAMP was inaccurate (eg. Carnarvon).			approval.
6.2	Regular inspections are undertaken of asset performance and condition.	As part of the Carnarvon site visit it was discovered that substation inspections had not been conducted as planned. Insufficient awareness at Esperance depot of status of substation inspections. 10% QA checks of 2008-09 Esperance pole inspections had not been done and are due to be done in 2010-11 which will be late for quality control purposes. Most projects had completion and final inspection signed off, however, on a number of projects this had not been done.	A	3	▸ Confirm that all inspection plans are being carried out as scheduled including transmission and sub-station inspection. Reports and data on transmission assets, including substation inspection and status of the assets should be made available to the respective district management. ▸ Document requirements for Quality Assurance (QA)/auditing inspections for wood pole maintenance in asset management plans. ▸ Plan and carry out inspections in a timely fashion. ▸ Implement consistent completion and/or final inspection sign-off.
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary.	All safety incidents are reported and centrally managed through CINTELLATE. Consideration should be given by HP to use CINTELLATE or other equivalent system to record non-safety related incidents, for example, incidents affecting the integrity of systems and of the organisation. A recent CURA failure involved a restoration process of over a week and it would be useful to investigate such failures and make	B	2	▸ Recording and management of non-safety related incidents should be implemented using CINTELLATE or similar system. ▸ [**OFI**]Where applicable there should be more in depth analysis of main contributors to low reliability figures for assets.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
		recommendations to minimise the impact of future occurrences and downtime. There may be an opportunity to further improve HP's network reliability by analysing some of the main contributors to failures. In Esperance, the normalised System Average Interruption Frequency Index (SAIFI) shows that one of the main contributors to the EHR605 Gibson feeder unreliability is equipment failure (causing 38.8% of failures); at this stage no data was apparent to indicate which specific equipment was causing the failures.			
7	**Asset Management Information Systems**				
7.1	Adequate system documentation for users and IT operators.	Much of the 'hands on' knowledge of the asset management information systems is with key individuals and not necessarily documented to the extent necessary for new staff inductions. There are significant plans to remove the existing complexity in systems, which would ease the documentation burden.	C	2	▸ With introduction of new systems review / upgrade IT system documentation and training requirements.
7.2	Input controls include appropriate verification and validation of data entered into the system.	Programs are in place to correct inaccurate data in the system. Examples found of assets missing from 'Asset Register' or with inaccurate data. Examples observed of document control being non existent or only partially used.	C	3	▸ Program to verify and correct inaccurate data in asset registers should be continued and completed. While resources have been allocated to correct the data, there is a need to better quantify the task and resource requirements. ▸ Document control system should be improved to ensure tighter control of issue and revision, that the DAMPs format is consistent, use document author, reviewer and approver consistently and DAMPs are clearly identified when in draft and when approved.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
		It appeared that DFMS data could be easily updated / incorrectly overwritten with no facility for reversing or logging the changes.			▸ Apply better version/revision control and ensure asset management plans follow one single development stream and no multiple versions exist. ▸ A control should be in place for the verification / review of the accuracy and completeness of the plans prior to approval. ▸ DFMS system lacks a facility to store historical data. If new data is entered in error previous data cannot be viewed or restored. There should be consideration of a facility to view the asset historical records and recover from errors.
7.4	Physical security access controls appear adequate.	Esperance site visit found inadequate perimeter security at depot and office/depot induction not consistent with other sites.	A	2	▸ Re-visit and apply physical security / access restrictions to Esperance depot. ▸ **[OFI]** Consider improvement in safety/visitor induction procedures for Esperance office/depot.
7.5	Data backup procedures appear adequate.	While it appears that there is a schedule of daily / weekly backup via a services agreement with WP and there was evidence of recent test result plans (April 2009), the exact terms and testing regime of this backup are not clearly understood by personnel. A procedure did not appear to exist for the restoration of data for all the various systems. A recent failure of a minor system (CURA) involved a restoration process of over a week and it would be useful to investigate such failures and take actions to minimise the impact of future occurrences and downtime.	C	2	▸ Confirm and maintain test records for data backup and restoration across all systems / databases. ▸ Document procedure for restoration of IT systems to minimise down time. ▸ Educate personnel on restoration procedures.
7.6	Key computations related to licensee performance	Reliability Data Validator application is in place to validate performance data, some of the data is	A	2	▸ [OFI] There may be an opportunity for improvement in documenting the method for monitoring and verifying fault data entry.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	reporting are materially accurate.	reviewed through a manual checking process.			
8	**Risk Management**				
8.1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.	A number of policies and procedures seem to suitably govern the identification and treatment of risks. Risk is one of the main criteria that drives asset planning. Risk register / risk workshops are actively used to identify capital project expenditure. There may be an opportunity to improve the value of risk management by including in the analysis the review of internal risks, including risks associated with succession strategy, loss of key specialists in the organisation, loss of corporate systems etc.	A	2	▸ [OFI] Consider evaluation of internal risks such as loss of key specialists in the organisation, loss of IT systems.
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored.	Risks are identified at district level and centrally managed within CURA system. Risk register has some duplication of risks as well as missing date information. Treatment plans are actioned through the asset management plans and risks are routinely discussed at periodic meetings. There is a lack of transparency in how risk levels are being used to drive capital project priorities in DAMPs. There does not appear to be a ready way to cross reference risks in DAMPs and Risk Register.	A	2	▸ Remove duplication of risks from register and ensure all actions are allocated dates and responsible party. ▸ Link risks from Risk Register to DAMPs (improve transparency).

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
9	**Contingency Planning**				
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	A Crisis, Emergency & Business Continuity Management System sets out general procedures for managing a wide variety of incidents / events. More specific emergency response procedures are available at each depot. Some of the depot plans were still in draft (eg. Esperance, Karratha, Carnarvon etc). There are some specific contingency procedures which are used in some of the district and are not documented in the district plans. For example, Carnarvon Generation plan should include the response plan for the loss of PLC software. Response plans require that after the event a debriefing meeting be minuted and a report be prepared following the meeting. An incident investigation is also required after an emergency. In some districts there was a lack of evidence / documentation on testing of the emergency response and review of the event.	A	3	▸ Finalise and issue District Contingency Plans. ▸ Identify and document specific contingency procedures in district contingency plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software. ▸ Effective management of testing of emergency procedures is recommended. Review of emergency response and recording of debrief sessions and improvement action should be carried out in accordance with the procedures. Similarly for testing of evacuation procedure. ▸ There is a need to include in each district plan, a clear strategy on how a loss of IPP supplies will be managed and to identify where, when, how and to what extent alternatives will be available.
10	**Financial Planning**				
10.6	Significant variances in actual/budget income and expenses are identified	Actuals vs. budget are routinely discussed during review meetings. Actions are raised and monitored as necessary. Reasons for variances in small projects can	A	1	▸ [**OFI**] Review the use of existing variance documentation.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	and corrective action taken where necessary.	be documented in appropriate forms which are retained in the project files, however, this was not consistently evident.			
11	**Capital Expenditure Planning**				
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	Each district operations management action plan outlines responsibilities and dates for capital projects, but much of this planning is still being developed.	B	2	▸ Complete operations management plans for each district.
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.	Capital expenditure plans are reviewed annually (as part of the DAMPs) and driven by the need to seek government budget approval, however, there is currently no strict control on the due date for these reviews.	B	1	▸ Document deliverables and timeline for annual asset management planning documentation, disseminate responsibilities to districts and monitor progress.
12	**Review of AMS**				
12.1	A review process is in place to ensure that the asset management plan and the asset management system described therein	DAMPs have been issued incomplete and in need of correction. Currently there is no strict control on the due date for these reviews.	B	2	▸ Strengthen DAMPs review process to ensure accuracy, timing, review, approval and monitoring of control status.

Item	Asset Management System Element / Requirement	Summary of Issues	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	are kept current.				

Licensee's Response To Previous Audit Recommendations

After reviewing the specific actions undertaken by Horizon Power to address GHD's recommendations, Qualeng have concluded that the Licensee has taken a systematic approach, through the use of the CURA management system and specific workshops, to identify all actions arising from the previous review and implement corrective action plans. Many more actions have been added in an effort to further improve the system.

The process is now pursued with strong commitment and appears to be working satisfactorily across the organisation.

Qualeng believe that the core issues that gave rise to the original recommendations have largely been resolved. Where, in the reviewer opinion, there may still be long term actions on those recommendations, those actions have been noted in the post review implementation plan included in this review.

Summary Review Of The Control Environment

At the conclusion of the review, Qualeng found that Horizon has in place a comprehensive system to manage the planning, development and implementation of its asset management plans across the Licence area. The asset management system is detailed and wide ranging. It has a sound basis relying both on corporate policies and detailed strategies, delegation of control and accountability for the different aspects of the system.

A suite of performance indices help measure and monitor the performance of the system and of the districts. A hierarchy of regular meetings and appropriate reports help the coordination and review of actions and their status. A new risk register has been developed to manage risks of the organisation. This is supported by a hazard identification and management system that could be extended to address all failures. The review meetings and interviews identified a number of key staff that are committed to driving the system, managing its performance and focusing on improvement.

The review found that the system was still under development and a number of observations and recommendations were made. Horizon Power were aware of various issues and improvements had been identified and were at various stages of implementation.

There were some weaknesses in the control of documentation in terms of version control, accuracy and completeness. Some of the District Asset Management Plans were still incomplete but not identified as such; review and approval of the plans needs to be improved.

Performance in some of the districts was affected by IPPs operation but there was no obvious reporting of IPP performance against regulatory standards.

Inspection of transmission assets, including sub-stations, whilst taking place, needs better communication and reporting to the districts. Emergency and contingency plans have been prepared by the districts since the previous review, however the plan testing process needs improvement and review of the actual responses and test outcomes needs to be documented.

IT services are still relying on service agreements with Western Power for key IT operation, however there are plans to separate from Western Power and in the process, address the complexity of the IT systems supporting asset management. Back up and restoration procedures will also need to be reviewed and better documented.

Within the asset registers there was still a proportion of data that was incorrect and will require follow-up.

While training systems are being managed satisfactorily through the endeavour of key staff, a better integrated training system is under consideration and is recommended. Training aspects and work procedures of the Karratha Control Centre will need to be better documented.

Asset Management Review Effectiveness Summary

A summary of the findings is shown in Table 2 using the Effectiveness and Performance ratings defined in Table 4 and Table 5 (pages 30-31).

Overall the review concluded that Horizon Power asset management processes have been adequately defined and are operating effectively. Improvement actions have been identified to further strengthen the system and an effective monitoring system is in place to control the implementation of those changes.

Table 2: Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM	Asset Management process and policy definition adequacy rating	Asset management performance rating
Process Effectiveness rating	A - D*	1 - 4*
1. Asset planning	B	2
2. Asset creation/ acquisition	B	2
3. Asset disposal	B	2
4. Environmental analysis	B	2
5. Asset operations	A	2
6. Asset maintenance	A	2
7. Asset management information system	B	2
8. Risk management	A	2
9. Contingency planning	B	3
10. Financial planning	A	2
11. Capital expenditure planning	B	1
12. Review of asset management system	B	2

* See Table 4 and 5 for definition of ratings

This report is an accurate representation of the findings and opinions of the reviewers following the review of the client's conformance to nominated Licence conditions. The review is reliant on evidence provided by other parties and is subject to limitations due to the nature of the evidence available to the reviewer, the sampling process inherent in the review process, the limitations of internal controls and the need to use judgement in the assessment of evidence. On this basis Qualeng shall not be liable for loss or damage to other parties due to their reliance on the information contained in this report or in its supporting documentation.

The Post Review Implementation Plan is included in this report to complete the documentation, however it does not form part of the reviewer's opinion or the final report.

Approvals

Representation	Name	Signature	Position	Date
Auditor:	M Zammit		Lead Auditor / Engineering Manager, Qualeng	
Licensee:	T Corfield		Technical Regulation Engineer, Horizon Power	

Issue Status

Issue No	Date	Description	Prepared	Verified	Approved
00.01	18/11/09	First draft	SC/MZ		
00.02	16/12/09	Second draft.	SC/MZ	JH	MZ
00.03	26/2/10	Third draft	SC/MZ		MZ
00.04	9/3/10	Fourth draft	SC/MZ		MZ
01.00	20/4/10	Final Report, first issue	SC/MZ		MZ

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1 Objectives and Scope of Review

1.1 Introduction

Horizon Power supply electricity and electricity services across 34 townships isolated from the South West Interconnected System (SWIS). These extend from the Kimberley in the North to Esperance in the South, 5 remote Aboriginal communities and the North West Interconnected System (NWIS). In addition to their own power generation plant in Carnarvon, Marble Bar, Nullagine, Kununurra and Wyndham, Horizon Power also purchase electricity from third parties.

Horizon Power transmit and distribute electricity to both residential and commercial customers. The transmission system, the NWIS, is about 450km in length and consists of the transmission line between Dampier in the West Pilbara to Goldsworthy in the East Pilbara with ring systems in Karratha and Port Hedland, with voltages up to 220kV. The distribution system is nearly 6000 km in length and comprises 6.6kV, 11kV, 22kV and 33kV systems.

Horizon Power (HP) have an Electricity Integrated Regional Licence (EIRL2 Licence) (the Licence) issued by the Economic Regulation Authority (the Authority) under Sections 7 and 15(2) of the Electricity Industry Act 2004 (WA) (the Act).

Under Section 14 of the Act HP are required to provide to the Authority an Asset Management System Review of the HP EIRL2 Licence.

In August 2009 HP commissioned Qualeng to carry out an Asset Management System Review to cover the period 1 April 2008 to 30 September 2009 . This follows the first of such reviews completed by GHD in November 2008 for the period 30 March 2006 to 31 March 2008.

The review has been conducted and this report prepared in accordance with the Authority's Audit Guidelines: Electricity, Gas and Water Licences (July 2009) and the Audit Plan prepared by Qualeng and approved by the Authority (September 2009).

1.2 Review Objectives

The purpose of the asset management system review is to assess the measures taken by the Licensee for the proper management of assets used in the provision and operation of services and, where appropriate, for the construction, alteration or disposal of relevant assets.

1.3 Scope Of Review

An asset management system comprises the processes and plans needed to ensure that physical assets continue to provide a specified level of service in a cost-effective manner throughout their useful life.

The system review assessed the effectiveness of the following 12 asset management sub-components:

1. Asset planning
2. Asset creation/acquisition
3. Asset disposal
4. Environmental analysis
5. Asset operations
6. Asset maintenance
7. Asset management information system
8. Risk management
9. Contingency planning
10. Financial planning
11. Capital expenditure planning
12. Review of the asset management system

The review encompassed the following activities:

- meetings and discussions with key HP personnel,
- documentation review (including an update on the corrective actions raised in the 2008 Asset Management Systems Review by GHD),
- risk and materiality assessment,
- facility and site visits,
- system testing; and
- post review implementation planning.

The review was carried out between August and November 2009 following the previous review completed by GHD in November 2008. Compliance testing was conducted based on the risk assessment and priority ratings documented in the Audit Plan prepared by Qualeng.

On HP's behalf, various representatives participated in the review including the Technical Regulation Engineer, Terry Corfield and Manager Asset Strategy and Capability, Brett Hovingh. Various other representatives contributed to sourcing the documentation and providing evidence to the review. A list of personnel interviewed is included in section 1.6.

The main auditor representatives were Mr M Zammit, Project Director and Lead Auditor, Mr S Campbell, Project Engineer and Auditor / Reviewer, Mr J Heng, Verifier and Reviewer. A total of 460 hours were required to complete the core review tasks. Minor resource use and support staff have not been included in the total. Audit team hours were broken down as follows:

M Zammit	Project Director / Lead Auditor	270
S Campbell	Project Engineer / Auditor	175
J Heng	Verifier & Reviewer	15

A list of the main documents accessed by the auditors is included in Appendix A. It is noted that this list does not include all of the documentation viewed during the audit, due to the large number of electronic documentation made available for verification as well as documents sampled during certain compliance tests and field visits.

1.4 Review Methodology

The review followed the methodology defined in the Authority's "Audit Guidelines: Electricity, Gas and Water Licences", July 2009, including:

- preparation of an audit plan, risk and materiality assessment and system analysis,
- fieldwork including the asset management system review; and
- reporting.

For the Asset Management System Review an audit plan was prepared outlining the review objectives, scope, risk and materiality assessment, system analysis, fieldwork plan, the report structure, key contacts, auditing staff and program.

The review adopted a risk based approach where a preliminary risk and materiality assessment was carried out for each asset management sub-component to evaluate the risks resulting from non-compliance and/or lack of controls and assessing the control procedures in place within HP.

The existing controls were rated and an audit priority assigned depending on the risk resulting from the lack of controls or adequacy of the existing controls. Tests were also defined for each asset management sub-component to assess the compliance and effectiveness of the current process.

Following the Authority's approval of the Audit Plan in September 2009, the review proceeded with meetings, interviews, checks of processes and documentation review. These were supported by additional queries to further clarify aspects of HP's policies and procedures and site visits to the following locations:

1. Bentley,
13. Karratha,
14. Carnarvon,
15. Kununurra & Wyndham; and
16. Esperance.

1.5 Limitations And Qualifications

A review provides a reasonable level of assurance on the effectiveness of control procedures, however there are limitations due to the nature of the evidence available to the auditor, the sampling process inherent in the checking of evidence, the limitations of internal controls and the need to use judgement in the assessment of evidence.

In regard to the review process, the auditor relies on supplementary evidence being available to the auditor to demonstrate the effectiveness of the control procedures, when the initial process and procedures do not provide sufficient evidence to the level that would be required by the review.

1.6 Horizon Power Staff Interviews

The following HP staff were either interviewed or attended meetings during the course of the review:

Bentley Office

Terry Corfield – Technical Regulation Engineer

Brett Hovingh - Manager Asset Strategy and Capability (was Manager Business Operations North)
Scott Beckwith – Manager Business Operations South
Ziggy Wilk - General Manager Operations
Phoebe Colman - Management Systems and Business Efficiency Manager
Simon Duggan - Separation Programme Manager
Meryl Hunt - Governance Coordinator
Kevin Carey - Network Technical Data System Admin
Bill Bignell - Transmission Asset Strategy Manager
James Chow - Senior Power Systems Engineer
Shane Eeles - Workforce Capability Improvement Manager
Marion O'Connor - Administration Support

Karratha depot, West Pilbara district
Glenda Teede, DBM
Alan Porter, DOO Distribution
Wayne Karslake, DOO Transmission
Maurice Ryan, WDC Transmission
Alf Martin, Superintendent HPCC

Carnarvon depot, Gascoyne district
Mark Bruce, DBM
John Wilson, DOO Distribution
Daryl Wright, DOO Generation
Barry Saunders, WDC Generation
Neil Streatfield, WDC Distribution
David Shelton, CCRM
Jim Stent, safety representative

Kununurra depot, East Kimberley district
Tony Lister, DBM
Graham Vick, DOO
Garry Hine, Approved Contractor, Wyndham

Esperance depot, Esperance district
Layton Baker, DBM
Scott Frazer, DOO
Ken Bracknell, MPSO
Mal Smithies, WDC

1.7 Acronyms And Terms

Table 3: Acronyms and Terms

Acronym / Term	Description
AMP	Asset Management Plan
AMS	Asset Management System
AS	Australian Standard
CAD	Computer Aided Drafting
CAPEX	Capital Expenditure
CCRM	Community and Customer Relations Manager
CIN	Incident Reporting and Management System
CURA	Computer system to record and manage legal obligations and risks to Horizon Power.
CUSA	Customer Service Overhead Attachment
DAMP	District Asset Management Plan
DBM	District Business Manager
DFA	Delegated Financial Authority
DFIS	Distribution Facilities Information System
DFMS	Distribution Facilities Management System
DMS	Document Management System
DOO	District Operations Officer
DQM	Distribution Quotation Management System
DRE	Data Remote Entry
DSM	Demand Side Management.
Ellipse	Enterprise Asset and Financial Management System
EIRL	Electricity Integrated Regional Licence
Financial Services	Horizon Power Financial Services Division
Gating Process	The Horizon Power capital and operating expenditure decision making process.
GIS	Geographical Information Services
HP	Horizon Power
HPCC	Horizon Power Control Centre
HR	Human Resources
IPP	Independent Power Producer from which Horizon Power purchases electricty.
IT	Information Technology
JRA	Job Risk Analysis
KPI	Key Performance Indicators
kV	Kilovolts

Acronym / Term	Description
LAN	Local Area Network
LCC	Life Cycle Costing
LNG	Liquefied Natural Gas
MEX	Maintenance Management Software
MO	Major Overhaul
MPSO	Power Systems Officer, Maintenance
MSO	Management System Officer
MST	Maintenance Schedule Task
NMS	Geospatial maps of network assets in the NWIS.
NQR	Network Quality and Reliability Report
NWIS	North West Interconnected System
OFI	Opportunity for Improvement
OPEX	Maintenance and Operating Expenditure including operational projects
P&ID	Piping and Instrumentation Drawings
PIP	Project Information Pack
PLC	Programmable Logic Controller
PRIP	Post Review Implementation Plan
QE	Qualeng, the Reviewer
SAFETRAC	Legislative tracking and training system
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency index
SAM	Strategic Asset Management
SAMP	Strategic Asset Management Plan
SBF	State Budget Forecast
SCADA	Supervisory Control and Data Acquisition System
SCI	Statement of Corporate Intent
SDP	Strategic Development Plan
SLA	Service Level Agreement
SWIS	South West Interconnected System
TCMS or TCS	Trouble Call Management System. A database and reporting system that records equipment faults, history and technical data with respect to fault reports, TCS is the new system.
TIMS	Transmission Information Management System
TLS	Transmission Lines System. A database that records physical details and locations of transmission lines.
TN	Single line drawings of transmission substations and systems in the NWIS.

Acronym / Term	Description
TO	Top Overhaul
TPES	Transmission Protection Equipment System. Data base and reporting system that records relay testing, location, setting data, and system performance data.
TPMS	Transmission Plant Management System. Data base and reporting system that records equipment location, history and technical data.
TRIS	Transmission Rating Information System. A database that reports circuit ratings for various conditions.
Twisties	Preformed Helical Terminations
VT	Voltage Transformer
WAN	Wide Area Network
WDC	Works Delivery Coordinator
WO	Work Order
WSMS	Work Scheduling Management System

2 Licensee's Response to Previous Audit Recommendations

2.1 Background

Horizon Power (HP) were granted an Integrated Regional Licence on 30 March 2006 by the Authority. The first asset management systems review under the terms of the licence was completed in November 2008 by GHD. This section reviews HP's progress on GHD's audit recommendations as well as HP's planned actions to address any outstanding issues.

A copy of GHD's Post Review Implementation Plan is included in Appendix B. HP subsequently expanded on GHD's recommended actions and the current status of each of these expanded actions is also included in Appendix B.

2.2 Progress

HP initially included a number of continuous improvement tasks in their Implementation Plan which HP assessed to be outside the intention of GHD's original recommendations.

These tasks, listed below, have now been removed from HP's internal tracking of GHD's recommendations and are being monitored separately:

Task No.	Task Name / Description
0.111	Review and document maintenance management process. CONTINUOUS IMPROVEMENT ACTION: Review and document maintenance management process using DRE, Ellipse, WSMS and DFMS.
0.112	Develop and implement training plan in Maintenance Management Process. Develop and implement training plan for relevant divisional personnel in Maintenance Management Process.
0.113	Conduct DFMS training progressively from April.
0.115c	Implement new maintenance management process.
11.1	Include ERA observations in reviewing and documenting of maintenance. Include ERA observations in reviewing and documenting of maintenance management process using DRE, Ellipse, WSMS and DFMS (ref action 0.111 above)
17.2	Modify DQM to match the new Ops Project Mgt Framework process.

Having reviewed the GHD recommendations originally linked to the above tasks, QE share the view that the above tasks, while related, do fall outside the specific intent of GHD's recommendations.

The document in Appendix B summarises the actions undertaken by HP to address GHD's recommendations. QE have reviewed these actions with HP and are of the view that the issues that gave rise to GHD's original recommendations have been largely resolved, with the following reservations:

GHD Recommendation	QE Comment
Finalise the Generation AMP	HP have an approved strategic generation

	asset management plan (SAMP) which details the strategic management of its generation assets. The districts have prepared district generation asset management plans (DAMPs) which follow on from the SAMP. This was the first year of the generation DAMPs and some information was not available at the time of the review.
Prepare disposal plans for obsolete power stations and redundant depot stockpiled assets.	HP's Operations Asset Disposal Procedure (April 09) guides personnel through various considerations for the disposal of assets. A number of disposal projects were viewed.
Develop environmental analysis sections in HP's Generation AMP under preparation with a direct link to local environment planning data available from the external peak bodies, Western Australian Planning Commission and Landcorp	While environmental analysis sections have been added to HP's Generation AMPs, QE found blank / incomplete data in some documents (eg. Esperance DAMP).
Regularly test the Contingency Plans	During the site visits, QE discovered that there is room for improvement in documenting / reviewing the outcomes of emergency plan tests and contingency plan events (eg. Cyclones). Post-event reviews did not appear to be systematically documented, despite this task being a procedural requirement.
Review and update asset management planning documentation including corporate policy, plans and procedures that were developed for Network Customer Services and Generation Services during the HP inception but have not been reviewed for the past two years. Some documentation remains in the Western Power livery and format.	There are a large number of documents used by HP that remain under the Western Power banner. HP's current approach is to re-brand these documents as their own only upon document review (ie. new version issue), which appears reasonable given the large number of documents and relative low importance of this task.

2.3 Further Actions

With regard to GHD's 2008 review recommendations, QE recommend the following further actions:

1. Review all Generation DAMPs for accuracy and completeness.
17. In regard to the Operations Asset Disposal Procedure, while asset under-utilisation was sometimes noted, it was not routinely acted upon due to the impracticality of disposal of asset. On this basis, it appears that asset disposal may not be the most cost effective policy and under-utilisation may be unavoidable. Overall, QE recommend that the treatment of under-utilisation should be better documented as a policy or procedure to provide some baseline justification and direction on the preferred approach.
18. Ensure the contingency and emergency plan test procedures are being consistently and correctly applied for both actual cyclone events and emergency tests. Where this is impractical or not required, update the contingency and emergency plan test procedure accordingly for consistency.

The recommendations above are included in the recommendations arising from the current review, further discussed in Section 3 and listed in the Executive Summary and Appendix D.

2.4 Overall Assessment

After reviewing the most recent task status presented by HP in Appendix B and the specific actions undertaken to address GHD's recommendations, Qualeng have concluded that the Licensee had taken a systematic approach, through the use of the CURA management system and specific workshops, to identify all actions arising from the previous review and implement corrective action plans. Many more actions have been added in an effort to further improve the system.

The process is now pursued with strong commitment and appears to be working satisfactorily across the organisation.

QE believe that the core issues that gave rise to the original recommendations have been largely resolved. Where, in the Reviewer opinion there are still long term actions in progress, appropriate recommendations as noted in Section 2.3, have been included in the new post review implementation plan (Appendix D).

3 Key Findings and Recommendations

3.1 Performance Summary

The findings of the asset management system review are summarised in Table 6. More details on the findings for all elements of the Asset Management System Review are presented in Section 3.2.

A Post Review Implementation Plan was prepared by the Auditor for the Licensee's review and approval, a copy of the plan is attached in Appendix D.

The summary below separately rates HP's Asset Management Process and Policy Definition **Adequacy** and **Performance** in accordance with the Authority's performance summary requirements. These rating definitions are reproduced in Table 4 and 5.

Where the adequacy of the process and policy definition is rated C or D, or the asset management performance is rated 3 or 4, corrective actions have been agreed with HP to address the issue(s) that have resulted in those ratings.

Table 4: Asset management process and policy definition adequacy ratings

Rating	Description	Criteria
A	Adequately defined	Processes and policies are documented. Processes and policies adequately document the required performance of the assets. Processes and policies are subject to regular reviews, and updated where necessary The asset management information system(s) are adequate in relation to the assets that are being managed.
B	Requires some improvement	Process and policy documentation requires improvement. Processes and policies do not adequately document the required performance of the assets. Reviews of processes and policies are not conducted regularly enough. The asset management information system(s) require minor improvements (taking into consideration the assets that are being managed).
C	Requires significant improvement	Process and policy documentation is incomplete or requires significant improvement. Processes and policies do not document the required performance of the assets. Processes and policies are significantly out of date. The asset management information system(s) require significant improvements (taking into consideration the assets that are being managed).
D	Inadequate	Processes and policies are not documented. The asset management information system(s) is not fit for purpose (taking into consideration the assets that are being managed).

Table 5: Asset management performance ratings

Rating	Description	Criteria
1	Performing effectively	The performance of the process meets or exceeds the required levels of performance. Process effectiveness is regularly assessed, and corrective action taken where necessary.
2	Opportunity for improvement	The performance of the process requires some improvement to meet the required level. Process effectiveness reviews are not performed regularly enough. Process improvement opportunities are not actioned.
3	Corrective action required	The performance of the process requires significant improvement to meet the required level. Process effectiveness reviews are performed irregularly, or not at all. Process improvement opportunities are not actioned.
4	Serious action required	Process is not performed, or the performance is so poor that the process is considered to be ineffective.

Table 6: Asset Management System Review Findings and Recommendations

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
1	Asset Planning	Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.				
1.1		Planning process and objectives reflect the needs of all the stake holders and is integrated with business planning	There is a comprehensive process integrated with business planning. Through a number of periodic studies and surveys and the annual asset management plan updates, stakeholder needs are considered. Planning studies for Hopetoun and Norseman were not carried out and were just overdue in Carnarvon and Kununurra / Wyndham. Carnarvon and Esperance Generation DAMPs were incomplete and need review/updating. DAMPs require better document and process control to ensure accuracy and completeness, consistent approval and control over timing.	B	2	▸ Review requirements for planning studies and prepare planning studies for Hopetoun, Norseman and other required localities. ▸ Complete Distribution planning studies for Carnarvon and Kununurra. ▸ Complete Carnarvon and Esperance Generation District Asset Management Plans (DAMPs). Missing data and follow-up actions need to be tracked. ▸ Improve control and ensure consistency across all planning documents such as DAMPs. Use document author, reviewer and approver consistently. ▸ Apply better version/revision control of DAMPs and control of review and issue cycle.
1.2		Service levels are defined.	Both quantitative and qualitative regulatory obligations are defined and monitored. Additional performance measures are developed as necessary to monitor assets. Some of the reported KPIs are below target.	A	2	▸ Continue with application of corrective action to minimise non-compliant KPIs.
1.3		Non-asset options (eg. demand management) are considered.	While no formal or consistent procedure appeared to be defined evidence of individual approaches to demand side	C	2	▸ Continue the demand side management trial leading to the development of guidance or methodology on the

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			management was noted within the districts. Demand side management is currently in trial stages via a pilot project.			adopted approach.
1.4		Lifecycle costs of owning and operating assets are assessed.	Lifecycle costs seem to be considered at a high level in business cases as required. Development is underway to develop a more comprehensive life cycle costing model.	B	2	▸ Complete development of life cycle costing model. Ensure consistent application of life cycle costing model across organisation.
1.5		Funding options are evaluated.	Funding options are appropriately assessed as part of the gating process for all projects.	A	1	
1.6		Costs are justified and cost drivers identified.	Business Cases and Asset Management Plans present / justify both capital project costs and operating costs.	A	1	
1.7		Likelihood and consequences of asset failure are predicted.	A central risk register is maintained and updated as a result of periodic district risk workshops and other meetings. Various examples of risk assessment and application sighted during site visits. Some areas of CURA still in development and needing improvement.	A	2	▸ Improve quality control over CURA data (ensure due dates for actions are entered and maintained current).
1.8		Plans are regularly reviewed and updated.	Asset management plans are reviewed annually and driven by the need to seek govt. budget approval, however, there is currently no strict control on the due date for these reviews. Related planning such as the Distribution System Planning Studies are overdue according to their intended update cycle. Review of planning documents during the site visits revealed that document control was inconsistent and/or not applied	B	3	▸ Document and monitor update cycles for all key planning documents. ▸ Consider a more robust document management system for version/revision control, document dissemination to stakeholders and general quality control. ▸ Consider improved verification of DAMPs to ensure accuracy, completeness and suitability for approval.

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			where expected. Evidence of incomplete and missing planning documents also discovered.			
2	**Asset Creation and Acquisition**	A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.				
2.1		Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions.	Comparative assessment of non-asset solutions could be better integrated into the gating process and / or business case templates. Life cycle costing and modelling could be made more transparent. Various business case examples sighted during site visits.	B	2	
2.2		Evaluations include all life-cycle costs.	There is some evidence of life-cycle cost modelling in the examples of business cases reviewed, however, this could be made more transparent with a formal life cycle cost model for new acquisitions.	B	2	▸ Complete development of life cycle costing model. ▸ Ensure consistent application of life cycle costing model across organisation.
2.3		Projects reflect sound engineering and business decisions.	The gating process encompasses both engineering and business considerations for capital project approval.	A	1	
2.4		Commissioning tests are documented and completed.	Forms were in use to record commissioning tests results. Except for one project all projects viewed had satisfactory test records. Most projects had completion and final inspection signed off, however, on a number of projects this had not been done.	B	2	▸ Strengthen the consistency of project completion and/or final inspection sign-off in accordance with forms in use.

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
2.5		Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.	There is a central register (CURA) maintained and updated, recording all business obligations. A monthly governance report summarises and disseminates compliance progress. Training of relevant staff is being undertaken for certain obligations, but could be extended and better integrated with other training areas of the business. Sampling of projects / documentation during site visits confirmed compliance.	A	2	▸ [**OFI**] There may be scope for extending and better integrating the governance training system with other training areas of HP leading to a centralised training system.
3	**Asset Disposal**	Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.				
3.1		Under-utilised and under-performing assets are identified as part of a regular systematic review process.	The annual asset planning process routinely identifies performance issues with assets. Asset under-utilisation while sometimes noted, is not routinely acted upon due to the impracticality of de-rating or mothballing. The treatment of under-utilisation could be better documented as a policy / procedure.	B	2	
3.2		The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.	Poor performance is routinely evaluated and acted upon as part of the annual planning cycle. This was further verified during the site visits. There is a recent procedure for asset disposal documented, but less evidence of asset disposal in the asset management plans due to under-utilisation.	C	2	▸ Document policy and/or procedure for the treatment of under-utilised and/or poorly performing assets.
3.3		Disposal alternatives are evaluated.	There is evidence that asset disposals (where undertaken) are in accordance with the asset disposal procedure documented, which requires the consideration of alternatives.	A	1	

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
3.4		There is a replacement strategy for assets.	Both age and condition driven replacements are adequately driven by the strategic directions set by the Asset Strategy and Capability group. Evidence of asset replacement strategies gathered during site visits.	A	1	
4	**Environmental Analysis**	The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain requirements.				
4.1		Opportunities and threats in the system environment are assessed.	There was evidence of system threats and opportunities being assessed in the asset management plans. CURA acts as the central register of system threats / risks – these are routinely assessed and assigned to appropriate individuals to confirm compliance. Opportunities and threats are further assessed by Community and Customer Relations Managers in the districts who report developments for entry into corporate forecast network facility.	B	2	
4.2		Performance standards (availability of service, capacity continuity, emergency response, etc) are measured and achieved.	Balance scorecards are maintained to measure the key areas of business operations. These measures are further analysed with respect to performance against regulatory and internal hurdles in areas such as the asset management plans. There is room for improvement in meeting some of the benchmarks established as well as ensuring sufficient data is being received from IPPs to monitor compliance. Emergency response is not currently part of the KPI suite maintained.	B	2	▸ Confirm sufficient data being received from all IPP sites to measure compliance and document/report formally IPP performance. Obtain documentation on IPP contingency plans. Consider use of non- conformance reports to deal with IPPs failures. ▸ [**OFI**] Investigate the feasibility of placing back to back responsibility on the IPPs in future Service Level Agreements for compliance with the regulatory requirements. ▸ [**OFI**] Consider adding contingency/emergency response

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
						measures to the balance scorecard.
4.3		Compliance with statutory and regulatory requirements.	All statutory and regulatory requirements are documented and communicated as appropriate throughout the organisation, however, there is some room for improvement against the benchmarks mandated.	A	2	
4.4		Achievement of customer service levels.	It appears that overall, expected customer service levels are being achieved, however, for certain sub-systems (ie. feeders) improvement is possible. The last stakeholder satisfaction survey indicated that stakeholders were on average satisfied, despite some ratings being lower than the previous survey. Power quality issues associated with the Ord River Hydro station are well documented.	A	2	▸ Continue to ensure that performance benchmarks are being achieved or corrective actions are being raised as appropriate.
5	**Asset Operations**	Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.				
5.1		Operational policies and procedures are documented and linked to service levels required.	Operating guidelines and instruction manuals for plant were noted during the site visits, however, in one case (Wyndham PS) site manual was out of date. Procedures for operation at HPCC are in preparation. Procedure for verification of fault reports at the HPCC will need to be documented.	A	2	▸ Ensure site manuals are kept up to date. ▸ Continue with documentation of procedures for HPCC activities, including a procedure for the verification of fault reports.
5.2		Risk management is applied to prioritise operations tasks.	There appears to be a strong focus on risk prioritisation driving field operations, from discussions at periodic meetings, to management through CURA and action in the	A	1	

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			field.			
5.3		Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical / structural condition and accounting data.	There is a suite of Distribution and Transmission systems comprising the 'Asset Register' – no one system contains all requisite asset details. Although the asset information maintained appears comprehensive, the myriad of systems and reliance of key individuals and WP for support is not ideal. Some data, such as pole age is known to be inaccurate. HP are also aware of existence of incorrect data in the Asset Register, more information is provided in section 3.2.7. While resources have been allocated to correct the records, the amount of incorrect data is significant and there may be a need to better quantify the task and resource requirements. There are already plans to streamline asset record keeping as well as improve the accuracy of the data.	B	3	▸ Complete measures to streamline and integrate various 'Asset Register' systems. ▸ Complete project to update data associated with asset age profiles. ▸ Continue and strengthen actions to verify the accuracy of the data entered in the asset registers.
5.4		Operational costs are measured and monitored.	Operational costs are budgeted in the asset management plans for approval, monitored routinely in meetings and measured in financial records (Ellipse). There could be some improvement in further automating the transfer of data into Ellipse to decrease delay and improve accuracy..	A	2	
5.5		Staff receive training commensurate to their responsibilities.	There are currently several areas of training responsibility and the coordination of records between corporate, skills and asset management training could be improved to increase clarity in the training records. There are already plans in place	B	2	▸ Proceed with consolidation of training records and training system. ▸ Document training needs and program for HPCC staff. ▸ Record training attendance and competency requirements

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			to consolidate training competency records. At present there does appear to be a number of adequate record keeping systems. At Karratha Control Centre (HPCC) training attendance records were not available, training plans and needs were not documented and training packages were in preparation.			for staff in HPCC.
6	**Asset Maintenance**	Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.				
6.1		Maintenance policies and procedures are documented and linked to service levels required.	HP possess quite a comprehensive suite of maintenance procedures, many inherited from WP and some that could possibly be streamlined into fewer documents. DAMP review and site visits revealed that some of the maintenance data in the DAMP was inaccurate (eg. Carnarvon).	A	2	▸ Consider improved verification of DAMPs to ensure accuracy, completeness and suitability prior to approval.
6.2		Regular inspections are undertaken of asset performance and condition.	The asset management plans document the routine maintenance cycles required by each asset class and a maintenance index KPI reports on the progress of open work orders. Maintenance tasks are also discussed in routine meetings at district level. 10% QA checks of 2008-09 Esperance pole inspections had not been done and are due to be done in 2010-11 which will be late for quality control purposes. As part of the Carnarvon site visit it was discovered that substation inspections had not been conducted as planned. Insufficient awareness at Esperance depot of status of substation. Most projects had completion and final	B	3	▸ Confirm that all inspection plans are being carried out as scheduled including transmission and substation inspection. Reports and data on transmission assets, including substation inspection and status of the assets should be made available to the respective district management. ▸ Document requirements for Quality Assurance (QA)/auditing inspections for wood pole maintenance in asset management plans. ▸ Plan and carry out inspections in a timely fashion. ▸ Implement consistent completion and/or final inspection

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			inspection signed off, however, on a number of projects this had not been done.			sign-off.
6.3		Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule.	Corrective and preventative maintenance tasks are managed through the various distribution, transmission and generation 'Asset Register' systems – reports are routinely run and discussed on job progress. Crisis and emergency response procedures are in place and routinely tested. A Maintenance Index is monitored as a measure of outstanding maintenance tasks. Some improvement can be made with respect to completing maintenance tasks on time.	A	2	
6.4		Failures are analysed and operational/maintenance plans adjusted where necessary.	There exists a procedure for hazard / incident reporting, notification and investigation. All safety incidents are reported and centrally managed through CINTELLATE. Analysis and recommendations are made based on risk assessments. Progress on actions are effectively monitored through a monthly Safety and Health Report and various district level meetings. There may be an opportunity to further improve HP's network reliability by analysing some of the main contributors to failures. In Esperance, the normalised System Average Interruption Frequency Index (SAIFI) shows that one of the main contributors to the EHR605 Gibson feeder unreliability is equipment failure (causing 38.8% of failures); at this stage no data was apparent to indicate which specific equipment was causing the failures.	B	2	▸ Recording and management of non-safety related incidents should be implemented using CINTELLATE or similar system. ▸ [**OFI**]Where applicable there should be more in depth analysis of main contributors to low reliability figures for assets.

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
6.5		Risk management is applied to prioritise maintenance tasks.	Inspection outcomes and routine maintenance tasks are assigned a priority signifying severity or risk. These priority ratings are used to prioritise work packages and to report and monitor task completion.	A	1	
6.6		Maintenance costs are measured and monitored.	Maintenance costs are budgeted in the asset management plans for approval, monitored routinely in meetings and reported in financial records.	A	1	
7	**Asset Management Information Systems**	The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.				
7.1		Adequate system documentation for users and IT operators.	Much of the 'hands on' knowledge of the asset management information systems is with key individuals and not necessarily documented to the extent necessary for new staff inductions. There are significant plans to remove the existing complexity in systems, which would ease the documentation burden.	C	2	▸ With introduction of new systems review / upgrade IT system documentation and training requirements.
7.2		Input controls include appropriate verification and validation of data entered into	Programs are in place to correct inaccurate data in the system. Examples found of assets missing from 'Asset Register' or with inaccurate data.	C	3	▸ Program to verify and correct inaccurate data in asset registers should be continued and completed. While resources have been allocated to correct the data, there is a need to better quantify the task and resource

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
		the system.	Examples observed of document control being non existent or only partially used. It appeared that DFMS data could be easily updated / incorrectly overwritten with no facility for reversing or logging the changes. DFMS system lacks a facility to store historical data. If new data is entered in error previous data cannot be viewed or restored.			requirements. ▸ Document control system should be improved to ensure tighter control of issue and revision, that the DAMPs format is consistent, use document author, reviewer and approver consistently and DAMPs are clearly identified when in draft and when approved. ▸ Apply better version/revision control and ensure asset management plans follow one single development stream and no multiple versions exist. ▸ A control should be in place for the verification / review of the accuracy and completeness of the plans prior to approval. ▸ There should be consideration of an asset register with historical functionality, incorporating a facility to view the asset historical records and recover from errors.
7.3		Logical security access controls appear adequate, such as passwords.	There is a hierarchy of system access / passwords that seem reasonable. Access to documents, specific systems and modules is in accordance with sound business practice.	A	1	
7.4		Physical security access controls appear adequate.	Physical access is restricted by the control of swipe cards and visitor registration at reception. Printers are also swipe card enabled to improve document security. Esperance site visit found inadequate perimeter security at depot and office/depot induction not consistent with other sites.	A	2	▸ Re-visit and apply physical security / access restrictions to Esperance depot. ▸ **[OFI]** Consider improvement in safety/visitor induction procedures for Esperance office/depot.

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
7.5		Data backup procedures appear adequate.	While it appears that there is a schedule of daily / weekly backup via a services agreement with WP and there was evidence of recent test result plans (April 2009), the exact terms and testing regime of this backup are not clearly understood by personnel. A procedure did not appear to exist for the restoration of data for all the various systems. A recent failure of a minor system (CURA) involved a restoration process of over a week and it would be useful to investigate such failures and take actions to minimise the impact of future occurrences and downtime.	C	2	▸ Confirm and maintain test records for data backup and restoration across all systems / databases. ▸ Document procedure for restoration of IT systems to minimise down time ▸ Educate personnel on restoration procedures.
7.6		Key computations related to licensee performance reporting are materially accurate.	Reliability Data Validator application is in place to validate performance data, some of the data is reviewed through a manual checking process.	A	2	▸ [OFI] There may be an opportunity for improvement in documenting the method for monitoring and verifying fault data entry.
7.7		Management reports appear adequate for the licensee to monitor licence obligations.	There is a suite of reporting and meetings at management level to routinely and effectively assess compliance with licence obligations.	A	1	
8	**Risk Management**	An effective risk management framework is applied to manage risks related to the maintenance of service standards.				
8.1		Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.	A number of policies and procedures seem to suitably govern the identification and treatment of risks. Risk is one of the main criteria that drives asset planning. Risk register / risk workshops are actively used to identify capital project expenditure. There may be an opportunity to improve the value of risk management by including in the analysis the review of internal risks, including risks associated with	A	2	▸ [OFI] Consider evaluation of internal risks such as loss of key specialists in the organisation, loss of IT systems.

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			succession strategy, loss of key specialists in the organisation, loss of corporate systems etc.			
8.2		Risks are documented in a risk register and treatment plans are actioned and monitored.	Risks are identified at district level and centrally managed within CURA. Treatment plans are actioned through the asset management plans and risks are routinely discussed at periodic meetings. There is a lack of transparency in how risk levels are being used to drive capital project priorities. There is some duplication of risks as well as missing date information. There does not appear to be a ready way to cross reference risks in DAMPs and Risk Register.	A	2	▸ Remove duplication of risks from register and ensure all actions are allocated dates and responsible party. ▸ Link risks from Risk Register to DAMPs (improve transparency).
8.3		The probability and consequences of asset failure are regularly assessed.	A corporate risk evaluation methodology is followed to identify both the probability and consequences of asset failure. This is evident in systems like CINTELLATE and CURA.	A	1	
9	**Contingency Planning**	Contingency plans have been developed and tested to minimise any significant disruptions to service standards.				
9.1		Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	A Crisis, Emergency & Business Continuity Management System sets out general procedures for managing a wide variety of incidents / events. More specific emergency response procedures are available at each depot. Some of the depot plans were still in draft (eg. Esperance, Karratha, Carnarvon etc).	A	3	▸ Finalise and issue District Contingency Plans. ▸ Identify and document specific contingency procedures in districts' contingency plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software. ▸ Effective management of testing of emergency

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
			There are some specific contingency procedures which are used in some of the district and are not documented in the district plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software. An annual role playing exercise is used to test contingency plans and staff understanding / awareness. Response plans require that after the event a debriefing meeting be minuted and a report be prepared following the meeting. An incident investigation is also required after an emergency. In some districts there was a lack of evidence / documentation on testing of the emergency response and review of the event.			procedures is recommended. Review of emergency response and recording of debrief sessions and improvement action should be carried out in accordance with the procedures. Similarly for testing of evacuation procedure. ▸ There is a need to include in each district plan, a clear strategy on how a loss of IPP supplies will be managed and to identify where, when, how and to what extent alternatives will be available.
10	**Financial Planning**	A financial plan that is reliable and provides for the long-term financial viability of the services.				
10.1		The financial plan states the financial objectives and strategies and actions to achieve the objectives.	The financial plan is part of the annual submission to the executive and minister. The "Strategic Development Plan 2008-09 to 2012-13" (SDP) provides the strategic direction to the business operation. The SDP presents the context in which the plan operates, the achievements, the objectives in the separate areas of the business and the strategies that will be used.	A	1	
10.2		The financial plan identifies the source of funds for capital expenditure and recurrent costs.	The SDP identifies sources of funds for operating and capital expenditure.	A	1	

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
10.3		The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets).	The SDP contains the financial outlook and the expected outcome if the plan is adopted, together with forecasts of revenue, operating and capital expenditure, profit and loss, balance sheet and cash flow over a 5 year period.	A	1	
10.4		The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period.	Income predictions are present in the financial plan.	A	1	
10.5		The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services.	Each asset management plan forecasts operating, maintenance and capital project funding needs.	A	1	
10.6		Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.	Actuals vs. budget are routinely discussed during review meetings. Actions are raised and monitored as necessary. Reasons for variances in small projects can be documented in appropriate forms which are retained in the project files, however, this was not consistently evident.	A	1	▸ [**OFI**] Review the use of existing variance documentation.
11	**Capital**	A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and				

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
	Expenditure Planning	evaluation of alternatives and options.				
11.1		There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	Each district operations management action plan outlines responsibilities and dates for capital projects, but much of this planning is still being developed.	B	2	▸ Complete operations management plans for each district.
11.2		The plan provide reasons for capital expenditure and timing of expenditure.	A 5 year capex project list summarises the projects identified in the asset management plans, their expenditure requirements and timing.	A	1	
11.3		The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan.	Detailed information on the CAPEX Plan drivers is included in each DAMP. Capital projects identified in the asset management plans are driven by one of seven asset fit for purpose requirements, safety, compliance, capacity, reliability, quality, age and cost.	A	1	
11.4		There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.	Capital expenditure plans are reviewed annually (as part of the DAMPs) and driven by the need to seek government. budget approval, however, there is currently no strict control on the due date for these reviews.	B	1	▸ Document deliverables and timeline for annual asset management planning documentation, disseminate responsibilities to districts and monitor progress.
12	**Review of AMS**	Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.				

Item	Asset Management System Element	Requirement	Summary of Findings / Observations	Adq. Rtg.	Perf. Rtg.	Recommended Corrective Actions
12.1		A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.	An asset management improvement process is in place to identify improvements in asset management / planning. Periodic meetings are also used to identify and action areas of improvement. DAMPs have been issued incomplete and in need of correction. Currently there is no strict control on the due date for these reviews.	B	2	▸ Strengthen DAMPs review process to ensure accuracy, timing, review, approval and monitoring of control status.
12.2		Independent reviews (eg internal audit) are performed of the asset management system.	Both internal and external (some mandatory) audits are performed of the asset management system to identify areas of improvement. Audit recommendations and subsequent action is monitored through CURA and the monthly governance reporting	A	1	

3.2 Discussion

The following sections report on the findings of the Asset Management System review. Where applicable, observations, recommendations and opportunities for improvement (OFI) are noted in each section. The report follows the order provided in the Authority's guidelines. A discussion on the operation of the system elements looks at all relevant criteria given by the Authority and at the evidence of compliance.

Horizon Power have implemented a comprehensive asset management system where, on a yearly basis, district plans are prepared for the distribution, transmission and generation systems following the direction of relevant strategic plans. The planning cycle timeline is based on the due date for finance approval. High level documents provide the strategic direction for the plans. Asset system performance is monitored in monthly reports and meetings and the plans are reviewed yearly.

3.2.1 Asset Planning

HP has in place a comprehensive planning process to encompass its operational regions and to support its customers and stakeholders. A "Statement of Corporate Intent" and a "Strategic Development Plan 2008/9 to 2012/13" set the company strategy based on its obligations and market conditions. The Strategic Development plan reviews the requirements, objectives and plans for generation, networks, customer service and regulation. It looks at the current and future financial position, funding and future outcomes, the company's management systems, resources and environmental considerations both in terms of the physical environment and of opportunities and threats to the asset management system. The current status of systems and resources is reviewed and development strategies are then defined.

Fit for purpose criteria are used to target and measure performance against safety, compliance, capacity, growth, reliability, quality, age and cost service levels. Targets are set for performance against social, environmental, economic and business capability criteria. Operating revenue and costs are reported and future trends predicted. Capital expenditure is similarly reported.

The high level "Statement of Corporate Intent" and "Strategic Development Plan 2008/9 to 2012/13" are supported by "Strategic Asset Management Plans" (SAMP) prepared on a yearly basis for Transmission, Generation and Distribution. Individual five yearly regional planning studies are carried out for each district to support the development of the district asset plans.

While regional planning studies were available for some of the regions, two of the plans requested during the review were being prepared and were behind their documented release date. Hopetoun and Norseman were documented as not requiring a planning study, which contradicted QE's understanding of those areas.

The "Network Assets Management Plan Transmission 2009/2010 to 2020/2021" was prepared in August 2009 to address the strategies and plans for meeting the service level standards for the transmission assets.

Specific "District Asset Management Plans" (DAMP) for each of the districts are prepared yearly, following the planning requirements and the directions set out

in their respective SAMPs. Most plans viewed in the review were well defined and consistent. However, the review found that some plans varied in completeness and accuracy. Two Generation plans (Carnarvon and Esperance) required further work for completion with lack of data in some sections and requiring correction in other sections. Root causes for the delays in completion appeared to be staff change and/or a lack of appropriate resources.

HP currently have defined a suite of both quantitative and qualitative performance criteria to monitor regulatory obligations. QE found that a process was in place to extend the coverage of these performance measures where required and take corrective action for under performing areas.

Demand side management is currently at trial stage via the pilot project "Demand Side Response Assessment & Deployment Opportunity". This project was at the proposal stage (at "Project Information Pack" or PIP stage) in June 2009. Brief guidelines are provided in the Transmission and Generation SAMP 2009. While no formal or consistent procedure / process appeared to be defined or followed, evidence of individual approaches to demand side management was noted during the site visits.

While HP appear to consider lifecycle costs as part of their business cases (where required), there does not appear to be an underlying model defined for organisation-wide use. It is understood that development is underway to develop such a life cycle costing model for more widespread deployment and use.

HP have a comprehensive "gating" framework for project evaluation, which includes consideration of project funding options. Business Cases and Asset Management Plans are used to justify both the capital and operating costs for projects.

A "Risk Management Risk Register" is compiled from a number of workshops and is managed through HP's CURA system by the Manager Systems & Business Efficiency. The CURA system records identified risks and controls the closure of corrective actions. The likelihood and consequences of identified risks are based on an organisation-wide risk matrix. It was noted that due to the recent implementation of CURA (April 2009), some of its areas still need improvement.

Asset management plans are reviewed annually. While a timeline is defined by the need to seek government budget approval, there is currently no strict control on the due date for these reviews. Review of selected planning documents during the site visits revealed that document control was inconsistent and/or not applied where expected. A hierarchy of parallel management and regional/district meetings review the progress of asset management activities and plans.

Recommendations:

1.	Review requirements for planning studies and prepare planning studies for Hopetoun, Norseman and other required localities.
2.	Complete Distribution planning studies for Carnarvon and Kununurra. Both planning studies were due 30 September 2009 had not been completed at the time of the review.
3.	District asset management plans require better control to ensure consistent formatting, including the correct implementation of control boxes with consistent means to indicate document version and status (ie. document is a draft or has been approved, dates of issue, identification of originators, reviewers and approvers and checks on document content). Effective document control would address issues observed in the review.
4.	There should be more obvious control or reporting on the status and

	progress on the issue of DAMPs.
5.	Generation DAMPs need to be completed. Missing data and follow up actions required to complete tasks need to be tracked. (eg. DAMPs should have extended forecasts, currently some of the DAMPs had forecasts only to 2010).
6.	Consider improved verification of DAMPs to ensure accuracy, completeness and suitability for approval.
7.	Continue the demand side management trial leading to the development of guidance or methodology on the adopted approach.
8.	Progress with development of methodology for life cycle costs and apply the methodology across the organisation.

3.2.2 Asset Creation and Acquisition

The acquisition of new assets goes through a "gating" process that prescribes, depending on project value, a number of submission, review and approval steps for considering both business and engineering aspects of the project. The process is set in motion by an initial high level proposal (PIP) which, if approved, goes through a more in depth evaluation via the preparation of a draft business case. Once the business case is approved it is further reviewed, refined and approved to full project status and implementation. Various business case examples were viewed during the site visits. While business cases did appear to assess life cycle costs, there did not appear to be (at the time of the audit) a formal life cycle cost model for new acquisitions. It is understood that HP are currently developing life cycle cost modelling.

Appropriate documentation was found on the projects reviewed, including supporting correspondence, job planning and work control forms, job risk assessments, commissioning check sheets and asset data sheets. Most projects had completion and final inspection signed off, however, on a number of projects this had not been done. Commissioning sheets had been completed for all projects except one.

HP maintain and update a central register (CURA) for the purpose of recording their business obligations and ongoing compliance. A monthly governance report summarises and disseminates regulatory compliance progress. The training of relevant staff is being undertaken for certain obligations using the SAFETRAC system. There may be scope for extending and better integrating this system with other training areas of HP, leading to a centralised training system.

A review of project management on site demonstrated the application of HP's procedures and staff awareness of the obligations of the asset owner. Projects showed appropriate check points to verify project compliance against requirements such as environmental considerations.

HAZOP/HAZIDs have been carried out for a range of assets and more have been identified for completion in 2010-2011.

Recommendations:

1.	Continue with the development of life cycle cost modelling and apply the methodology across the organisation..
2.	Strengthen the consistency of project completion and/or final inspection sign-off in accordance with forms in use.

Opportunities for Improvement:

1.	[OFI] There may be scope for extending and better integrating the governance training system with other training areas of HP leading to a centralised training system.

3.2.3 Asset Disposal

HP's annual asset planning process routinely identifies performance issues with assets. Evaluation of poor performance regularly leads to the definition of corrective actions. HP have documented a procedure for asset disposal dated April 2009 and presented numerous examples of asset disposal projects. This process was extensively corroborated during QE site visits, however, it appeared that while asset under-utilisation is sometimes noted, it is not routinely acted upon due to the impracticality of de-rating or mothballing. Due to the nature of some of the assets (eg. transmission and distribution lines) and the costs associated with their disposal being higher than their retention costs, under-utilised infrastructure is often retained rather than disposed. In Ravensthorpe a drop in customer demand has resulted in an under-utilisation of certain assets, however a better economic outlook is expected to re-introduce demand for these assets, which somewhat limits the consideration of disposal alternatives.

On this basis, it appears that asset disposal may not be the most cost effective policy and under-utilisation may be unavoidable. Overall, QE found that the treatment of under-utilisation could be better documented as a policy or procedure to provide some baseline justification and direction on the preferred approach.

Throughout the review and site visits there was evidence of age and condition driven replacement. Asset disposals (where undertaken) appeared to be in accordance with HP's documented asset disposal procedure, which requires the consideration of alternatives.

In some cases, noted in later sections, the asset age recorded in the asset register is known by HP to be inaccurate. For these instances, condition criteria have been established to guide replacement strategies.

Recommendations:

1.	Develop and implement a policy and/or procedure justifying the preferred approach to asset under-utilisation.

3.2.4 Environmental Analysis

Preparation of the Asset Management Plans commits HP to a process of strategic planning that is then translated into actions and project implementation. This planning cycle incorporates a review of opportunities and threats. Threats are further identified and assessed in risk workshops and then recorded in the CURA system which is HP's enterprise platform that manages risk and compliance obligations.

The district organisation structure includes the position of a Community and Customer Relations Manager (CCRM). The CCRM maintains a relationship with local business, the community and stakeholders, collecting data and feedback from Shire meetings and community publications and then reporting on the information collected. Development data is provided to the SCADA Manager, who produces

demand forecast reports and inputs the information into HP's PowerLink intranet. Reports from this facility provide demand and capacity forecasts over a number of periods and years and include information on possible future development. This information is accessed by the District as part of their planning activities.

The DAMPs report and analyse asset performance in the districts with respect to safety and environmental issues, reliability, quality, capacity, age, condition, regulatory compliance, maintenance, resources and capital work programs. Performance is monitored and reported monthly through a series of indicators. "Monthly Business Reports" summarise indicators for customer satisfaction and complaints, commercial customer satisfaction, reliability as perceived by customers, safety, compliance with legislation, asset performance, maintenance, work delivery and employee perception.

The DAMPs also report on KPIs for frequency and duration of interruptions down to individual assets. For distribution, this information is available at feeder level. While benchmarks are not always achieved, discrepancies are reported, monitored and analysed at various levels throughout HP's management structure. Corrective actions are noted in DAMPs and required improvement projects or maintenance activities identified.

Quality of supply is only monitored as far as customer quality complaints. Voltage and frequency are monitored in real time and readings reviewed. Power quality readings at transformers are taken once a year but only reported locally within the districts.

Quality of supply from IPPs is not reported. While IPP reliability is not reported in asset management plans by default, in some cases IPP failure can severely affect the reliability of HP. According to HP, in Kununurra, failure of the Ord River Hydro supply contributes from 25 to 50% of the reliability indicator for some associated feeders.

Currently there are no indicators for contingency or emergency response performance. It may be useful to consider an indicator which could report on the application and testing of procedures.

Overall, it appears that expected customer service levels are being achieved, however, for certain sub-systems (ie. feeders) further improvement is possible. The last stakeholder satisfaction survey indicated that stakeholders were on average satisfied, despite some ratings being lower than the previous survey and lower than the target.

In summary, there is room for improvement in meeting some of the benchmarks established by HP as well as ensuring sufficient data is being received from IPPs to monitor compliance.

Recommendations:

1.	As the reliability of HP power supplies depends on the performance of the IPPs, there needs to be continuous reporting and monitoring on the IPPs capability to meet regulatory requirements and assurance that the IPPs comply with the Authority's requirements. IPP performance against these standards should be documented, this could extend to IPPs' contingency plans. Lack of compliance could be documented by non conformance reports.

Opportunities for Improvement:

1.	Investigate the feasibility of placing back to back responsibility on the IPPs in future Service Level Agreements for compliance with the

	regulatory requirements.
2.	A measurement indicator should be implemented to monitor performance on contingency and emergency response. [OFI]

3.2.5 Asset Operations

Asset operation policies are translated into strategic plans ("Operations Division Strategic Plan 2008/09 - 2011/12") which provide a map for implementing the policies and achieving the objectives, as well as monitoring performance. The DAMPs are linked to Operational Management Plans (eg. "West Pilbara District Operations Management Action Plan - FY 2009-10), which further detail operational activities and the actions planned to achieve the performance benchmarks identified at corporate level. The main objectives relate to safety, community support and development, governance and planning, improvement, technology, leadership and people. Further actions and targets in various areas are also recorded and monitored, ranging from operational expenditure to projects identified in the DAMPs.

Operational guidelines and procedural manuals were found during the site visits. In one case an operations manual was out of date (Wyndham Power Station), however all other documentation viewed was consistent and up to date. In regard to the switching process the manual "HV Operations Switching Staff Guidelines" had been prepared and its roll-out started in June 2009.

HP appear to have a strong focus on risk prioritisation driving field operations, from discussions at periodic meetings to management through CURA.

There is a suite of Distribution and Transmission systems comprising the 'Asset Register', however, no single system contains all requisite asset details. Although the asset information maintained appears comprehensive, the number of systems and reliance on key individuals and Western Power (WP) for support is not ideal.

Some data, such as pole age is known to be inaccurate. HP are also aware of existence of other incorrect data in the Asset Register, more information is provided in section 3.2.7. While resources have been allocated to correct the records, the amount of incorrect data is significant and there may be a need to better quantify the task and resource requirements. HP already have plans to streamline asset record keeping as well as improve the accuracy of data such as pole age.

During the site visits it was noted that there was no apparent local awareness of the condition of inspections for the substation at Carnarvon and Esperance. Whilst the required inspections may have been carried out, there was no knowledge of the status of the asset within the district.

Operational costs are budgeted in the asset management plans and once approved, monitored routinely in meetings and measured in financial records (Ellipse). There could be some improvement in further automating the transfer of DQM & DFIS data into Ellipse to decrease the delay and improve the accuracy of data.

An overall training coordination function exists within the Operations Division and provides the focus point for training data collection and training program delivery. Records of training and competency are held for both employees and contractors.

There are currently several areas of training responsibility and the coordination of records between corporate, skills and asset management training

could be improved to increase clarity in the training records. At present, there does appear to be a number of adequate record keeping systems and there are plans in place to consolidate training competency records into one comprehensive system.

At the Control Centre in Karratha, training is provided for new staff but no records were available to demonstrate attendance. Training plans for HP Control Centre (HPCC) staff were also not documented as expected, there was no documentation of training needs specifying required system training for HPCC job positions (such as training for ENMAC, Network Management, Switching Program Management). Training packages are being prepared at present.

HPCC Work Procedure preparation was in progress. Procedure for verification of fault reports at the HPCC will need to be documented.

Recommendations:

1.	Ensure site manuals are kept up to date.
2.	Continue current actions to verify age of assets and age data in asset register.
3.	Continue and strengthen actions to verify the accuracy of the data entered in the asset registers.
4.	Complete measures to streamline and integrate various 'Asset Register' systems.
5.	Ensure that, where applicable, conditions and inspection information on all transmission assets is provided to local management and is monitored.
6.	Continue implementation of a consolidated training system.
7.	Document training needs and program for HPCC staff.
8.	Continue with documentation of procedures for HPCC activities, including a procedure for the verification of fault reports.
9.	Record training attendance and competency requirements for staff in HPCC.

3.2.6 Asset Maintenance

HP possess a comprehensive suite of maintenance procedures, many inherited from WP and some that could possibly be streamlined into fewer documents.

The asset management plans document the maintenance cycles required by each asset class, these range from monthly inspections for substations to several year maintenance cycles for switchgear. A maintenance index provides a measure for outstanding maintenance tasks. Maintenance programs are initially entered into Ellipse. When due, Maintenance Schedule Tasks (MSTs) automatically generate Work Orders (WO) for planned maintenance and condition monitoring work. The WOs are issued to HP's field crews or to approved contractors. WO data is recorded in Ellipse and discussed at monthly meetings at district level (MSO, DOO, WDC, Accounts attending).

As part of the site visits, various jobs were viewed for Transmission, Distribution and Generation that contained the information expected of a work order management system. During the Carnarvon site visit the "Maintenance Index" was not readily available , however, there was sufficient evidence to

confirm that maintenance plans were adequately managed. Based on reported maintenance indices it was noted that some improvement could be made in respect to completing maintenance tasks on time.

Some of the operations (e.g. Carnarvon Generation) have recently moved from an earlier record system (MEX) to Ellipse. Due to better training and awareness of the new program capability an improvement in the control and monitoring was observed.

During the site visits, review of the Carnarvon DAMP revealed that some of the maintenance data in the DAMP was inaccurate and required review.

As part of the Carnarvon site visit, it was observed that substation inspections did not appear to have been conducted as planned. As noted above, in section 3.2.5, in Esperance, there was a lack of awareness of substation inspection status. Results of inspections should be available to the district for effective management of the asset.

Wood pole inspections are carried out every four years. In the Esperance, district wood pole inspection had been carried out in 2008-09, however the corresponding 10 % auditing of inspections had not taken place and was programmed for the 2010-11 financial year, which appears to be late for quality control purposes.

Some of the records in DFMS were not correct or up to date, more details are reported in section 3.2.7.

Crisis and emergency response procedures are in place and routinely tested by HP, details are noted in section 3.2.9, Contingency Planning.

Whilst there is a facility in the job management system to sign off job completion with a final inspection (usually carried out by the DOO), this was found not to be done consistently.

There was evidence that a process is in place to manage failures through investigation, planning and implementation of corrective actions. The reporting of system faults, whether from customers or other sources, are also subject to a specific response process to check the nature of the fault and rectify it. Reliability figures are investigated in the DAMPs and causes of failures are identified in graphs and reported in detail, together with current or proposed strategies.

There may be an opportunity to further improve HP's network reliability by analysing some of the main contributors to failures. In Esperance, the normalised System Average Interruption Frequency Index (SAIFI) shows that one of the main contributors to the EHR605 Gibson feeder unreliability is equipment failure (causing 38.8% of failures); at this stage no data was apparent to indicate which specific equipment was causing the failures and it may be useful to investigate specific causes down a further level of detail.

Where failures are safety related incidents are reported and centrally managed through the CINTELLATE system. This system relies on a reasonably robust procedure for hazard / incident reporting, notification and investigation. Analysis and recommendations are made based on risk assessment. Progress on actions is effectively monitored through a monthly Safety and Health Report and various district level meetings.

Consideration should be given by HP to use CINTELLATE or equivalent system to record non-safety related incidents, for example, incidents affecting the integrity of systems and of the organisation. QE understand that a recent CURA

failure involved a restoration process of over a week and it would be prudent to investigate such failures and make recommendations to minimise the impact of future occurrences and downtime.

Inspection outcomes and routine maintenance tasks are assigned a priority signifying severity or risk. These priority ratings are used to prioritise work packages and to report and monitor task completion.

Maintenance costs are budgeted in the asset management plans for approval, monitored routinely in meetings and reported in financial records. The review inspected MST reports and scheduling generated as spreadsheets from Ellipse to approximately 2035, which included all maintenance activities, dates due and costs.

Recommendations:

1.	Consider improved verification of DAMPs to ensure accuracy, completeness and suitability prior to approval.
2.	Confirm that all inspection plans are being carried out as scheduled including transmission and substation inspection. Reports and data on transmission assets, including substation inspection and status of the assets should be made available to the respective district management.
3.	Document requirements for Quality Assurance (QA)/auditing inspections for wood pole maintenance in asset management plans. Plan and carry out inspections in a timely fashion.
4.	Implement consistent completion and/or final inspection sign-off.

Opportunities for Improvement:

1.	Where applicable there should be more in depth analysis of main contributors to low reliability figures for assets. [OFI]
2.	Recording and management of non-safety related incident should be implemented using CINTELLATE or similar system. [OFI]

3.2.7 Asset Management Information System

HP relies on various IT systems to support asset management. Briefly the main systems in use are:

- Enterprise Systems:
  - DMS (Document Management System), a system for storing and providing document identification and control. Document control capability is limited.
  - CURA risk management system and register, also for governance and compliance obligations, and due to house policy and procedure register.
  - TCMS (& TCS) (Trouble Call Management System) database and reporting system that manages fault calls, responses and reports (TCS is due to supersede TCMS at the end of 2009).
  - SAFETRAC system used to record obligations and monitor staff training and knowledge
  - CINTELLATE, hazard and incident management system.
  - SCADA Data system collects data from the assets and enables remote functions.
  - WSMS (Work Scheduling Management System).
  - Ellipse, Enterprise Management System.

- Distribution Systems
  - DQM (Distribution Quotation Management Information System) addresses work management and costs, it supports cost estimates and records project timelines.
  - DFMS (Distribution Facilities Management System) database and reporting system storing equipment location, maintenance and technical data.
  - DFIS (Distribution Facilities Information System) stores geographical information on distribution assets and as constructed drawings.
  - DRE (Data Remote Entry) provides for inspections and condition monitoring on distribution assets.

- Transmission and Generation Systems:
  - Ellipse (Enterprise Asset Management System), also ENMAC-Ellipse, stores all major assets information for transmission and generation. It includes routine maintenance data for Maintenance Schedule Tasks. (MSTs).
  - TPES (Transmission Protection Equipment System) database storing details of relay testing, performance, location, settings.
  - TPMS (Transmission Plant Management System) database storing location, history and technical information of equipment.
  - TRIS (Transmission Rating Information System) database storing circuit information.
  - TLS (Transmission Line System) database storing location and physical information of transmission lines.
  - PSS Fuel utilisation database.

Much of the 'hands on' knowledge of the asset management information systems is with key individuals and not necessarily documented to the extent necessary for new staff induction. HP have assessed that the information system is too complex and is not oriented to the business process. There are significant plans to rationalise the current systems by removing the existing complexity and duplication in systems which would ease the documentation burden. A business case for this is currently in development.

A number of information systems are supported by Western Power (WP) under a services agreement renewed until 30 June 2012. A separation program has been put in place to effectively 'cut wires' with WP over the next 3 years. HP are assessing the feasibility of using other service providers to replace WP's services (e.g. help / support).

A number of issues related to data control were observed during QE's review and are noted in the following table.

ISSUE	COMMENTS
1. Examples were found of assets missing from the 'Asset Register' or with inaccurate data. 1.1. A record of feeder off for 5 days had been entered in error. 1.2. Some of the data in the register was not correct: a Universal Pillar installed on Lot 1370 on Great Northern Highway Wyndham on 2/7/08 was not found in DFIS. Another job in that area may have affected the record, but the new asset had not been entered and was not shown in the drawings. 1.3. 531 out of 5672 records showed no	HP are aware of existence of incorrect data. While resources have been allocated to correct the data, there is a need to better quantify the task and resource requirements.

ISSUE	COMMENTS
inspection date for CUSA [Customer Service Overhead Attachments] program for service leads. These were supposed to be inspected in 2008. 1.4. Approximately 150 poles in the Esperance district did not have record of inspections when it was expected that they should have been inspected.	
1.5. Some of the poles in Esperance had creation dates ranging from 1901, to 1930, 1960 etc.	Issue known to HP. A plan is in preparation for correction of dates.
1.6. Found approximately 60 out of 5672 poles that did not have evidence of twisties replacement. Replacements were supposed to be finished in February 2009 but either records had not been entered or twisties not installed. Twisties replacement required "wedge clamp" and 'XLPE" conductor rather than PVC. Some of the records did not show evidence of this.	This was also found by a separate independent audit.
2. It appeared that DFMS data could be easily updated / incorrectly overwritten with no facility for reversing or logging the changes. There may be a need to provide a means to store historical data so that asset history can be reviewed. This would also assist with an investigation of the events linked with an asset or location.	

Most of the above issues are already known to HP and have in place corrective actions to rectify the discrepancies. For example, approximately 1 to 2 days per week are spent by local Esperance staff to correct DFMS data relating to the district. During the review it was estimated that the amount of incorrect data is still significant, therefore this activity will need to continue.

Physical data is currently stored either with HP or a hosted solutions provider. QE received some evidence of data backup / restoration services being provided and tested which related to the WP services agreement and recent test result plans (April 2009).

While it appears that there is a schedule of daily / weekly backup via the services agreement with WP, a procedure did not appear to exist for the restoration of data for all of the systems. As observed in section 3.2.6, QE understand that a recent CURA failure involved a restoration process of over a week and it would be useful to investigate such failures and take actions to minimise the impact of future occurrences and downtime.

There may be a need for a more robust document control system for issue and revision control and independent verification of documents (such as DAMPs) to avoid issuing incomplete or incorrect documents as final. Generation DAMP provided (dated 4/8/09) appeared to be a 'Draft' version as it was not approved and was missing information. Subsequent signed update provided was dated 7/7/09 so it was earlier than the unsigned version. Both documents were incomplete as they were missing data: it is recommended that such documents be identified as 'Drafts'.

There is a security hierarchy of system access / password control that appears

reasonable throughout HP's IT systems. Access to documents, specific systems and modules is in accordance with sound business practice.

At Bentley office physical access is restricted by the control of swipe cards and visitor registration at reception. Printers are also swipe-card enabled to improve document security. Other offices control access at reception. The Esperance site visit found inadequate perimeter security at the depot which is in part due to the sharing of the facility with the alliance contractor. All sites visited included adequate site induction except for one. The Carnarvon site and safety induction was excellent and could be used as a 'best practice' model for the other depots.

The Reliability Data Validator application is in place to validate performance data, some of the data is monitored and verified on spreadsheet based reports reviewed through a manual checking process. There may be opportunity for improvement in the documentation of this process.

There is a suite of reports and meetings at management level to routinely and effectively assess compliance with licence obligations.

Recommendations:

1.	Program to verify and correct inaccurate data in asset registers should be continued and completed. While resources have been allocated to correct the data, there is a need to better quantify the task and resource requirements.
2.	DFMS system lacks a facility to store historical data. If new data is entered in error previous data cannot be viewed or restored. There should be a facility to view the asset historical records.
3.	As noted earlier, the document control system should be improved to ensure that tighter control of issue and revision is enforced, that the DAMPs format is consistent and DAMPs are clearly identified when in draft and when approved.
4.	There should be better electronic control of documents to ensure that documents such as the asset management plans follow one single development stream and that no multiple versions exist.
5.	A control should be in place for the verification / review of the accuracy and completeness of the plans prior to approval.
6.	Confirm and maintain test records for data backup and restoration across all systems / databases.
7.	Procedure for restoration of data should be documented for all systems in use.

Opportunities for Improvement:

1.	There may be an opportunity for improvement in documenting the method for monitoring and verifying fault data entry.
2.	Consider improvement in safety/visitor induction procedures for Esperance office/depot.

3.2.8 Risk Management

Risk is one of the main criteria that drives HP's asset planning. HP have implemented policies and procedures for the management of risk. An initial risk

analysis divided the assets into classes and assessed their risks against PAS55. Risks were then entered into the CURA Risk Register (RR) which has been reviewed and improved since. The register is updated every month by the Management System Officer through individual "Video Conference" meetings with district action owners. A corporate risk evaluation methodology is followed to identify both the probability and consequences of asset failure. This is evident in systems like CINTELLATE and CURA.

At Monthly Divisional and District performance review meetings managers review the current actions. District Business Managers (DBM) attend two Divisional performance meetings per year to get exposure to the review process. Quarterly there is a Risk and Review meeting with the management team, this meeting highlights extreme and high risks. A district risk workshop is carried out six-monthly for each district to review risks at the district level. District level risks are added to the end of the CURA report.
All extreme and high risks are reported by the Managing Director at each Board meeting and also by the General Manager at each Executive meeting. Each Division will also report on their risk register at monthly management team meetings.

The CURA risk management system, generates automatic follow up e-mails which are sent to the action owner at the due date and monthly thereafter until closed. Treatment plans are actioned through the asset management plans and risks are routinely discussed at periodic meetings.

CURA also stores identified environmental risks, whilst environmental issues such as contaminated sites are registered in the Ellipse system.

HP have identified that some of their RR data includes duplicate risks as well as missing date information. QE understand that this data is being corrected at present.

The asset management planning cycle is closely tied with risk management in terms of both identifying and prioritising projects and their associated expenditure approval. However, the risks identified in the DAMPs are not yet comprehensively linked with the RR, although QE understand there are already plans by HP to improve the correlation.

There may be an opportunity to improve the value of risk management by including in the analysis the review of internal risks, including risks associated with succession strategy, loss of key specialists in the organisation, loss of corporate systems etc.

Recommendations:

1.	Continue with the correction and improvement of the Risk Register data.
2.	Improve the cross-referencing of risks related actions in DAMPs and the Risk Register.

Opportunities for Improvement:

1.	Consider evaluation of internal risks such as loss of key specialists in the organisation, loss of corporate systems etc. [OFI]

3.2.9 Contingency Planning

An overall Crisis, Emergency & Business Continuity Management System sets out general procedures for managing a wide variety of incidents and events. A

"Division Emergency Management Plan" applies the system to any of the districts sites and surrounding areas. Individual site contingency plans have been developed in each of the districts ranging from severe storms and cyclone response procedures to depot and power station emergency responses. For example, at Carnarvon the depot procedure includes response to fire, medical emergency, fuel and oil spills, chemical spill, bomb emergency, whilst the power station contingency plan outlines the procedures required for the speedy restoration of power supplies. Additionally, a District Contingency Plan addresses the restoration of power supply in the case of an incident affecting the distribution system.

The review found that some of the depot plans were still in draft (eg. Esperance, Karratha, Carnarvon etc).

There are some specific contingency procedures which are used in some of the district and are not documented in the district plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software.

There should be more information available on IPP contingency plans and on how a loss of IPP supplies will be managed.

These plans require that a review of the emergency procedures be carried out after the event, with the objective to address shortcomings and improve the procedure. Similarly Power Station Emergency Response plans require that after the event a debriefing meeting be minuted and a report be prepared following the meeting. An incident investigation is also required after an emergency.

An annual "refresher" activity or an "organisation-wide" role playing exercise are used to test the crisis management system plan as well as improve staff understanding and awareness of the procedures.

An evacuation response is also required to be tested yearly in each depot.

In regard to testing, as part of the site visits it was found that in some districts plans had been tested under real conditions, due to the regular occurrence of events like cyclones in the Pilbara. In other areas there was a lack of evidence / documentation on testing of the evacuation response and review and improvement to the documented procedures.

Recommendations:

1.	Finalise and issue District Contingency Plans.
2.	Effective management of testing of emergency procedures is recommended. Review of emergency response and recording of debrief sessions and improvement action should be carried out in accordance with the procedures. Similarly for testing of evacuation procedure.
3.	Identify and document specific contingency procedures in districts' contingency plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software.
4.	There is a need to include in each district plan, a clear strategy on how a loss of IPP supplies will be managed and to identify where, when, how and to what extent alternatives will be available.

3.2.10 Financial Planning

The annual planning cycle follows the "Budget Guidelines" cycle defined by financial services, the cycle itself is based on the due date for finance

approval. There is a process in place to prepare and submit financial plans to the Department of Treasury and Finance (DTF) including a 10 year Capital Investment Plan (CIP) and the State Budget Forecast (SBF) annually by the end of October. In addition, a Strategic Development Plan is provided to the Minister for Energy.

High level documents like the Statement of Corporate Intent and the Strategic Development Plan 2008-09 to 2012-13 (SDP) provide the strategic direction to the business operation. The SDP presents the context in which the plan operates, the achievements, the objectives in the separate areas of the business and the strategies that will be used. The SDP contains the financial outlook and the expected outcome if the plan is adopted, together with forecasts of revenue, operating and capital expenditure, profit and loss, balance sheet and cash flow over a 5 year period. Sources of funds are also identified.

Planning studies forecast the demand on the transmission, distribution and generation systems. The DAMPs address the plans and budgets necessary to meet that demand and to maintain and operate the assets. The DAMPs also identify the assets requiring replacement and the projects necessary for the achievement of operational and service goals. The DAMPs are then used as input into the five year budget and lead to the finalisation of the CAPEX and OPEX budgets. There is a further process of prioritisation of projects based on their assessed risk.

Maintenance expenditure is forecast using the Maintenance Schedule Tasks (MST) scheduled in the system, which allows for preventive routine or condition based maintenance. Allowance for emergency and unplanned reactive maintenance is made by reference to historical costs.

Projects identified in the DAMPs have to go through the 'Gating' process for approval. Delegated Financial Authority (DFA) exists for projects so that lower levels of authority are required for smaller projects, but these must also be in the budget to proceed.

Internally funded projects (e.g. generation) must be subject to HP's internal 'Gating' process. However, network projects to support non-small use customers are usually customer funded and therefore do not typically follow the same process.

Once approved the projects can be included in the DAMPs and in the budgets proposed for the following five years.

Expenditure outcomes from works identified in the DAMP is entered into HP's Enterprise Asset Management system (, i.e. Ellipse) either as OPEX in the asset register and project area of the system or as CAPEX (as projects).

There are four levels of reporting – Business Report, Divisional Business Report, Regional Business Report and District Business Report. The high level Business Report is prepared by financial services, which the Managing Director discusses with the board every two months.

Variances of actual vs. budget expenditure are routinely discussed during review meetings. Where variances are over 10% the DFA process is applied. Reasons for variances in small projects can be documented in appropriate forms which are retained in the project files, however, this was not consistently evident. Reasons for a variance in a project in Wyndham were discussed and appeared valid, however no information had been recorded in the form. There may be a need to reinforce the procedure.

Opportunities for Improvement:

1.	Review the use of existing variance documentation. [OFI]

3.2.11 Capital Expenditure Planning

Analysis in the DAMPs identifies any of a number of issues that impact the "fit for purpose" criteria such as safety, compliance, capacity, reliability, quality, age and cost, and which require appropriate action for improvement. Depending on the requirements, the corrective actions may result in operating or capital projects.

Each internally funded capital project has to be approved through a Business Case submission which follows the 'Gating' process. To be part of the following year's budget, each project has to be approved for inclusion. Funding for the asset management plans and for these project is subject to approval both by HP's Board and by Treasury. There may be negotiation to time the projects to the most appropriate period based on risk and costs. Once agreement is reached the budget is approved.

Once projects are approved they are added to the five year budget plan included in the asset management plans. A capital project schedule is developed to list the projects identified in the asset management plans, with outlines of responsibilities, their expenditure requirements, timing and drivers (safety, reliability, age etc).

New projects can also be initiated, even if not included in an approved Asset Management Plan, where current budgets are sufficient or if existing projects can be deferred. Even if funding is available the projects have still to go through the DFA / business case approval process.

Currently capital expenditure plans are reviewed annually (as part of the DAMPs) and driven by the need to seek government budget approval, however, there is currently no strict control on the due date for these reviews.

Operations Management Action Plans are then prepared listing the approved projects. QE understand that the roll-out of operations management action plans to each of the districts is still in its infancy. The example provided for the West Kimberley District did not appear complete and it is suggested that HP complete operations management action plans in each of the districts with appropriate document control and verification.

At district level capital projects expenditure and progress are reported monthly by DOOs using data gathered from the Ellipse system. The DFA process is applied to variances in expenditure greater than 10%.

Recommendations:

1.	Complete Operations Management Plans for all districts.
2.	Document deliverables and timeline for annual asset management planning documentation, disseminate responsibilities to districts and monitor progress.

3.2.12 Review of Asset Management System

Asset management plans are reviewed annually as part of the plan review and preparation cycle. The review looks at the previous 12 months performance and at the gaps in any of its "fit for purpose" reported results. The review also considers the strategic direction outlined in the SDP and in the Operations

Strategic Asset Management Plan (SAMP). SAMPs are prepared for Distribution and a combined one for Transmission and Generation. District Asset Management Plans are then prepared for each of the districts.

Performance of the business and the asset management plans is monitored through a bottom up approach along the lines of the planning process. Performance of the asset management plan is monitored monthly by each DBM, reviewed against the DAMPs and where available, the Operations Management Action Plan for the district and reported in a Monthly Business Report. The report details strategic objectives, performance against the "fit for purpose" criteria, maintenance and capital projects that are in progress, progress against key performance indicators, progressive operational profit and loss and detailed expenditure, capital works budgets and sales.

The reports are reviewed at each district's Monthly Performance Review Meetings.

Both internal and external (some mandatory) audits are performed on the asset management system to identify areas of improvement. Audit recommendations and subsequent action is monitored through CURA and monthly governance reporting.

Each month, a Governance and Compliance Report shows the status of the asset management system review and progress of the implementation of any recommendations arisen from external regulatory reviews. Those actions are also tracked in detail in the CURA system which follows-up any overdue action through automatic e-mailing.

An asset management improvement process is in place to identify improvements in asset management / planning. Periodic meetings are also used to identify and action areas of improvement.

External audits are also commissioned to assess elements of the asset management operation. An external audit was carried out this year by an independent auditor (Miles West) to verify inspection data. The audit focused on the "twisties" replacement project and found that 200 twisties remained in the Kimberleys, 130 in East Kimberley and 3 in Kununurra. 100 “twisties” records were found to be non-existent and are now due to be deleted.

As noted earlier in Sections 3.2.1 and 3.2.7, there is a need to improve the review and document control of critical documents such as the DAMPs. It is important that documents critical to the asset management planning process are identified, appropriately reviewed for accuracy, produced as scheduled and their issue monitored. The site visits found that DAMPs for Generation in Carnarvon and Esperance had incorrect or incomplete data and that their approval status was unclear.

There should be a better document control system (both for electronic and paper versions) to identify when documents are still in draft, the originator(s) of the document and the review and approval status.

Recommendations:

1.	Strengthen DAMPs review process to ensure accuracy, timing, review, approval and monitoring of control status.

4 Post Review Implementation Plan

A Post Review Implementation Plan (PRIP) is included in Appendix D. Each element of the asset management system review that has resulted in recommendations for corrective actions is listed in the PRIP. For each recommendation, HP has recorded responses, responsibility for the actions and a proposed completion date.

Appendix A
References and Documentation Reviewed

APPENDIX A: REFERENCES AND DOCUMENTATION REVIEWED

Due to the large amount of documentation accessed during the audit, only the main documents are referred in this list. Other documentation is individually referred to in the audit, review tables and report.

REFERENCES AND DOCUMENTATION REVIEWED

	Document Name	DMS Ref.	Date
	Reference Documents		
1	2008 Asset Management Systems Audit Actions Progress Report		12/08/09
2	2008 Distribution Wood Pole Audit Review		05/09/09
3	5 Year Capex Project List As At 14 August2009 For Initial Qualeng Review	#3193521 v1	14/08/09
4	AGENDA – District Performance Review Meeting	#3150852	
5	AGENDA – Operations Division, Management Team Planning / Strategy Meeting		01/09/09
6	AGENDA – Operations Management Team, Performance Review Meeting		17/08/09
7	AGENDA – Regional Review Meeting	#3150908 v1	
8	AGENDA – Regional Review Meeting	#31566642 v1	23/04/09
9	AGENDA – South Regional Review Meeting	#3173733 v1	18/06/09
10	Asset and Work Strategy Group Proposal		
11	Asset Management Process and Policy Definition Adequacy Ratings		
12	Asset Management systems review Audit Report Rev2 08		11/08/09
13	Audit and Risk Management Committee, Terms of Reference	#3011151 v2	
14	Australian Pathfinder For SKA Power Solution Business Case	#3175773 v3	16/07/09
15	Board & Executive Meeting Dates		2009
16	Briefing Paper For Fit For Purpose Indicator (Draft)	#3186358 v2	
17	Broome Decommissioning Documents		18/09/09
18	Broome Demand Response Expansion Business Case	#3189364 v1	
19	Business Case – Cura Risk Management And Compliance Software	#3116058 v4	
20	Business Planning Meeting Action Items Status Listing	#3105698 v2	
21	Carnarvon Commissioning Checklist for Genset and Transformers		25/09/09
22	Carnarvon Distribution Actioned/Pending Report		25/09/09
23	Carnarvon Ellipse Planned Maintenance Schedule		25/09/09
24	Carnarvon Fuel Orders and Consumption By Month Report		25/09/09
25	Carnarvon General Work Order		25/09/09
26	Carnarvon Maintenance Schedule Year Ahead		25/09/09
27	Carnarvon Maintenance Test Checklist		25/09/09
28	Carnarvon Pole Inspection Report By Misand Holdings		25/09/09
29	Carnarvon Power Station Contingency Plan	#3192443 1	
30	Carnarvon Power Station Development Project Business Case – Gating Process	#3169162 v 5	
31	Carnarvon Power Station Development Project FID Business Case	#3169162 v7	20/05/09
32	Carnarvon Schedule Maintenance Policy Listing		25/09/09
33	Carnarvon Work Order Report		25/09/09
34	Carnarvon Incident Record (Epsilon File)		11/09/09
35	Carnarvon Power Station Development Renewable Energy Business Case	#3170100 v3	29/04/09
36	Carnarvon Draft Model For Life Cycle Costs	#3194656 v2	
37	Cintellate, Incident and Related Outstanding Actions		Aug-09
38	Cintellate, Incident Example, Rod came through crankcase		13/05/09
39	Cintellate, Incident Example, Rollover of contractor's 4WD and trailer		07/09/09
40	Conductor Clashing Mitigation Strategy		
41	Crisis Emergency & Business Continuity Management System Part 1	#3125459 v2	Aug-08
42	Crisis Emergency & Business Continuity Management System Part 2	#3126164 v2	Aug-09
43	Crisis Emergency & Business Continuity Management System Part 3	#3126443 v1	14/07/09
44	Cura File List	#3199383	
45	Cura Technical Specifications		
46	Demand Site Response Assessment and Rollout Project Information Pack May 09	#3174957 v3	
47	DFIS Lesson 1 NT Course	#3160156 v1	
48	DFMA Inspection and Maintenance Process Utilising Notes		
49	DFMA Lesson 1,2,3, Ref Guide for Field Use	#3168721 v 1	
50	DFMS NT Browse Course Notes		
51	DFMS NT Update Module Workbook Training Course Notes		
52	District Asset Management Plan for Operational Generation Assets East Kimberley	#3170019	29/09/09
53	District Asset Management Plan for Operational Generation Assets West Kimberley	#3169992 v6	29/07/09
54	District Performance Review Meeting Action Items Status Listing	#3160390 V1	
55	Document Numbers for HP Policies		
56	East Kimberly District Organisation Chart	#3116926	
57	East Kimberly District Performance Review Meeting	#3173252 v1	
58	East Kimberly Risk Register		11/09/09
59	Electrical Compliance Report Manual		03/08/09
60	Ellipse Module 1 Procedure Work Order Generation	#3179580 v2	
61	Ellipse Module 1 Procedure Work Request	#3191560 v1	
62	Emergency Cyclone And Severe Storm Procedure	#3066717 v3	06/07/07
63	Emergency Response Procedures Karratha Depot	#3133052 v1	
64	Emergency Response Procedures - Broome Depot	#3002218 v2	
65	Emergency Response Procedures Esperance Depot	#3133050 v1	27/02/09
66	Emergency Response Procedures – Carnarvon Depot	#3000209 v2	
67	Emergency Response Procedures – Carnarvon Power Station	#3133049 v1	
68	Energy Safety, 2008 Distribution Wood Pol Audit Review		May-09
69	Environmental Management Systems		
70	Esperance District AMP 2009-10 Generation	#3170018 v1	04/08/09

	Document Name	DMS Ref.	Date
	Reference Documents		
71	Esperance District AMP 2009-10 Distribution	#3165194 v1	
72	Esperance Incident Report		
73	Esperance Monthly Business Report - KPI	#3158840	06/10/09
74	Esperance Work Schedule – Enrup		05/10/09
75	Gascoyne & Midwest Canarvon Lamp Summary		24/09/09
76	Gascoyne & Midwest District Asset Management Plan 2009-10 Generation	#3169998 v3	10/08/09
77	Gascoyne & Midwest District Organisation Chart	#3116926	
78	Gascoyne & Midwest Gating Process Project Information Pack (PIP)	#3107570 v3	
79	Gascoyne & Midwest Leonora Power Purchase Agreement Submission for Approval	#3164993	22/04/09
80	Gascoyne & Midwest Leonora Power Purchase Agreement Submission for Endorsement	#3159199	25/03/09
81	Gascoyne & Midwest Maintenance Schedule By Work Group		25/09/09
82	Gascoyne & Midwest Review of Options For Power Generation at Leonora by Evans & Peck	#20090213	16/02/09
83	Gascoyne District Asset Management Plan 2009-10 Distribution	#3165196 v5	
84	Gascoyne District Asset Management Plan 2009-10 Distribution	#3182209 v1	10/08/09
85	Gating Framework – Detail Methodology	#3034541 v6	30/01/08
86	Gating Process – Flowchart of Approval Process.vsd	#3033964 v3	
87	Gating Process – High Level Overview Of Process	#3099405 v2	30/03/09
88	Gating Process – Project Information Pack (PIP)	#3062328 v2	
89	Gating Process – Three Page Descriptor Of Process	#3037383 v3	
90	Grading Sheet	#31032S2	
91	Guidelines on Preparing a Capacity Planning Report	#3150732	01/01/09
92	Hazard/ Incident Reporting Notification and Investigation Procedure	#3016578 v 19	10/01/09
93	Horizon Power Capacitors and Reactors Under Direct Control Procedure	#3114367 v1	15/08/09
94	Horizon Power Environmental Policy		
95	Horizon Power Governance and Compliance Report July 09	#3187629 v1	
96	Horizon Power Governance and Compliance Report June 09	#3183087 v 1	
97	Horizon Power Governance and Compliance Report May 09	#3170436v1 3191294	
98	Horizon Power Incident and Related Outstanding Actions Report – Karratha		11/09/09
99	Horizon Power Substation Life Assessment	#HD24218	
100	Horizon Power Winter SMT Chart	#3118296 v7	
101	IO Sheet	#31032sS7	
102	Karratha Capital Works Process – Job Control	#3187004 v 1	22/09/09
103	Karratha Fault Tracking Report		22/09/09
104	Karratha Incident Report		18/12/05
105	Karratha Trench Shunt Reactor Test Report by Powereng PTY		22/09/09
106	Life Assessment of Horizon Power Substations by SKM		
107	Logica Performance Auditing Report		12/09/08
108	Mainframe Platform – Disaster Recovery Test	# 6029404	01/04/09
109	MAP – Horizon Power Supply Areas		
110	Midwest District Contingency Plan	#3191250 v1	05/08/09
111	Missing Procedure Project Plan		25/08/09
112	North Regional Review Meeting Agenda	#3173731 v4	
113	2029 Trends	#3193370	08/09/09
114	Operational Services Job Planning, Work Parcel Form	#1377721 v 13	21/09/09
115	Operations Asset Disposal Procedure	#3166526 v2	03/04/09
116	Operations Division - Management Team Planning Strategy Meeting Agenda	#3103491 v10	
117	Operations Division – Asset Management Plan Carnarvon Transmission Asset Capacity	#3171285 v1	10/08/09
118	Operations Division – East Kimberley District, District Asset Management Plan	#3157669 v1	17/09/09
119	Operations Division – Esperance, District Asset Management Plan	#3111242 v1	
120	Operations Division – Management Team Planning Strategy Meeting Action Items	#3105698 v6	
121	Operations Division – West Kimberley District, Operations Management Action Plan	#3178269 v1	Jul-09
122	Operations Division – West Pilbara District, Operations Management Action Plan	#3178251 v1	Jul-09
123	Operations Division Capital Project Approval Process	#3143469 / #3144368	
124	Operations Division Meeting Planner 2010	#3197428	
125	Operations Division Performance Review Meeting Action Items Status Listing	#3106759	
126	Operations Division- Management Team Performance Review Meeting Agenda	#3103486 v14	
127	Operations Division, Strategic Plan 2008/09 to 2011/12 (inc. Balanced Scorecards)		
128	Operations Divisional Structure.vsd	#3116926 v3	
129	Operations Maintenance Index Overview	#3196455 v1	
130	Operations operating budget 2010-15		
131	Operations Project Management Framework Ref Doc List – Karratha	#3145280 v1	
132	Pilbara AMP 2009-10 Transmission	#3166593 v6	04/08/09
133	Planting Policy	#3194808	
134	Policies and Procedures Register	#3010410 v 6	
135	Presentation for Energy Forecast New Model and Proposed Improvements		
136	Presentation to Qualeng on Asset Management Plan Process	#3142600	Sep-09
137	Proposed Asset Strategy and Works Services Group Structure v2		
138	Risk Management Policy	#3022921	Dec-07
139	Risk Register HP Version, Operations, Operations Risk Assessments		10/08/09
140	Risk Register with Causes and Impacts	#3198668	23/09/09
141	Risk Register With Impacts & Causes Kununurra	#110909	
142	Role Description -Standards and Performance Evaluation Manager Operations Division	#3187584 v1	
143	Role Description - Manager Commercial Contracts	#3121148 v1	
144	Role Description - Manager System Operations	#3118967 v2	

	Document Name	DMS Ref.	Date
	Reference Documents		
145	Role Description - Manager Workforce Capabilities Improvement	#3121227 v1	
146	Role Description - Strategy Systems Manager Operations Division	#3187581 v1	
147	Role Description – District Business Manager	#3119159 v4	
148	Role Description – District Operations Officer	#3119250 v1	
149	Role Description – General Manager Operations	#3019247 v2	
150	Role Description – Manager Asset And Works Strategy Operations Division	#3187586 v1	
151	Role Description – Manager Business Operations North And South	#3119736 v3	
152	Role Description – Networks Officer	#3121419	22/09/09
153	Role Description – Works Delivery Coordinator	#3119502 v2	
154	Safety & Health Programs/ Initiatives Plan 2010-2012		
155	Safety & Health Report, August 2009, Adrian Blackburn	#3190589	Aug-09
156	Schedules Extracts from Spec HP00314		
157	Setting Order System Screen Shots		
158	Shared Services Technical and Customer Support- Karratha Dis. Cap Upgrade	#3126050/3137990 v 2	22/10/09
159	Stakeholder Reputation Survey Business Planning Presentation	#3186601 v2	
160	Statement of Corporate Intent 2008		
161	Status of 2009 RAA Plan – as at 1 August 2009	#3191128 v1	01/08/09
162	Strategic AMP 2009-10 Distribution	#3150894 v2	20/03/09
163	Strategic Asset Management Plan 2009-10 Transmission and Generation	#3157279 v6	04/08/09
164	Strategic Development Plan 2008/09 to 2012/13	#3078254 v6	
165	Substation Inspection Verification Sheet – Carnarvon	#3127502 v 1	
166	Summary of Opex Report	#3199282	21/09/09
167	Synovate Stakeholder Reputation Presentation to Horizon Power Executive		
168	System Operations AMP 2009-10 Generation Mobile Fleet	#3184964 v2	29/07/09
169	System Operations Monthly Business Report – April 09	#3165801	22/09/09
170	Transformer Data system Screen Shots		
171	Trial Report Setup For Operations (Draft)	#3172335 v4	
172	West Kimberley District AMP 2009-10 Distribution	#3165202 v1	
173	West Kimberley District AMP 2009-10 Generation	#3169992 v6	
174	West Pilbara District AMP 2009-10 Generation	#3176845 v3	04/08/09
175	West Pilbara district Monthly Business Report – July	#3068115 v1	21/09/09
176	West Pilbara District AMP 2009-10 Distribution	5207 v1 3068545 v1 pg54-58	
177	Work Order Generation Procedure		
178	Work Priority Definition Procedure		
179	Wyndham Earth Wire Replacement, Work Order, Project File	#2741017 v1	16/07/09
	Miscellaneous Documents		
180	Integrated Regional Licence ERA		
181	Western Power, General Requirements	#2011463 v1	
182	Western Power, Networks Pole Inspection Manual, Asset Strategy		Apr-03
183	Western Power, Networks Wood Pole Inspection Field Handbook		Jul-03
184	Western Power, Scope of Services and Technical Requirements	#2011405 v1	

Appendix B

Previous Review Recommendations (GHD Review)

HORIZON POWER ELECTRICITY LICENCE ASSET MANAGEMENT REVIEW

Previous Review Recommendations

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Table 7: Previous Review Recommendations

AMS Element	Recommendations	Actions	Status	Further Actions
1	**Asset Planning**			
1.1	▸ (0.1) Investigate the "Extreme Risk" assets listed in the Risk Register with the view to accelerated bulk asset replacement of conductors and timber poles exposed to severe termite and salt environments. This recommended action is considered to be a priority in Carnarvon, where in- service conductor and pole assets are currently exhibiting structural failure.	▸ Completed preliminary Third Party asset inspections for Carnarvon, Denham, Exmouth and Gascoyne to confirm Asset condition. Inspections carried out and completed by MISAND by the end of March 2009. Conditions have been reviewed and confirmed by sample auditing. A strategy has been put in place for all short term & long term severity 1 & 2s. Split into Capex and Opex works. Work has been identified in DAMPs. Serious works packaged and done as part of current maintenance work. New positions of Power System Officers (PSO) created and filled. All Northern districts have PSO in place to monitor and issue work packages for inspections, corrective works and emergency repairs. These PSO also will be updating DFMS with maintenance information, overhead service replacement, streetlight updates and will be the point of contact for review of DRE inspections. The new positions will work through the new process with a review in 3 months.	Completed	
1.2	▸ (0.2) Review the past wood pole steel reinforcement programme and practices for technical appropriateness into the future and possible reintroduction to the Esperance District as part of the 2008/09 AMP.	▸ The technical specifications have been updated and have been issued to Esperance. Allocations have been made in future year capex budgets for bulk wood pole reinforcement. Work to commence in 2009/10.	Completed	
1.3	▸ Finalise the Generation AMP.	▸ Generation AMPs were reviewed by the Management team on 8-10 July 2009. Further detail was required regarding the operating budgets for some power stations before the plans could be	Documents prepared but some not	Action included in 2010 Post Review Implementation Plan, item 1.1

AMS Element	Recommendations	Actions	Status	Further Actions
		approved. Operations Management Team approved the District Generation AMPs on 10 August 2009.	completed	
2	**Asset Creation and Acquisition**			
2.1	▸ Develop policy and procedures to ensure that distribution design drawings are independently checked and reviewed before issuing to staff and/or contractors for construction.	▸ Reviewed the existing process (DQM) and implementation of the independent review process for distribution design drawings (as per the Operations Project Management Framework). Developed and documented the new processes and rolled out to districts. Powerdraft has been introduced to replace the powerpoint as a design drawing tool.	Completed	
2.2	▸ (0.5) Implement a standard project practical completion and handover certification for all regions.	▸ The implementation of certificates of practical completion / sign-off by customer has been reviewed. Modifications have been implemented on relevant processes (DQM, new Subdivision process). Handover process has been included in the sub division handbook. Checklists in work parcels have been modified to include handover process.	Completed	
3	**Asset Disposal**			
3.1	▸ (0.6) Prepare disposal plans for obsolete power stations and redundant depot stockpiled assets.	▸ Asset disposal Policy and procedure have been completed and issued. Disposal plan prepared. The plan has been updated to show two distinct phases. One for the removal of infrastructure and the second to clean the site. For the disposal of an asset that involves property, a form is to be completed. Disposal plans for the sites have been included in the AMP.	Completed	
4	**Environmental Analysis**			

AMS Element	Recommendations	Actions	Status	Further Actions
4.1	▸ (0.7) Develop environmental analysis sections in Horizon Power's individual NCS Regional AMPs with a direct link to local environment planning data available from the external peak bodies, Western Australian Planning Commission and Landcorp.	▸ Modified Generation and Network Strategic AMPs to include an environmental analysis section. Included environmental analysis in district AMPs. Various maintenance and internal capital projects incorporate environmental considerations.	Generation DAMPs environmental section not completed in all.	Action included in 2010 Post Review Implementation Plan, item 1.1
4.2	▸ (0.7) Develop environmental analysis sections in Horizon Power's Generation AMPs under preparation with a direct link to local environment planning data available from the external peak bodies, Western Australian Planning Commission and Landcorp.	▸ Environmental Analysis section has been added to the Transmission and Generation Strategic Asset Management Plan, under section titled "Environmental Load Forecast" and including required links.	Completed	
5	**Asset Operations**			
5.1	▸ (0.8) Amend the existing HV Switching Operations Manual to include "Instructions and Procedures" that effectively guide the electricity network operational interaction between Horizon Power Electrical Switching Operators, Electrical Contractors and IPPs. ▸ Prepare localised HV Switching Operations Staff Guidelines and training programmes to complement Horizon Power's existing and overarching HV Switching Operations Manual. The local guidelines will serve to acknowledge the specific switching requirements that have evolved for each district and contribute to a safer and more robust HV operational framework.	▸ Reviewed and modified switching instruction procedures and rolled out new Switchgear Instruction Manual (SIM) DMS# 3098761 which has been printed and delivered. Another document, "Electrical Safety Standards Booklet and Form" has been reworded and reprinted. The following actions have been completed: - An audit of the switching requirements has been completed at each depot; - Switching operator training modules have been developed for each switching level; - Training for levels 1-6 has been completed at all depots. These levels cover LV to zone substations which is virtually everything outside the Pilbara NWIS, where a lot of the switching is done by HPCC via SCADA; and - A Switching for Safety refresher training course has been developed and is now a mandatory annual requirement for all switching operators. The Auditor has observed use of Instruction Manuals in depots.	Completed	

AMS Element	Recommendations	Actions	Status	Further Actions
5.2	▸ (0.9) Prepare a Bio-Security Plan as a definitive section of the Esperance 2008/09 AMP	▸ Prepared Bio-Security Plan as a definitive section included in the Distribution Strategic Asset Management Plan and in DAMP for Esperance.	Completed	
5.3	▸ 10.a)Review fire protection requirements and segregation of primary switchgear from control systems in Power Station Control Rooms.	▸ Developed technical instructions for separation of switchgear from controls and included requirement in Strategic AMP. The separation documents are: 1. HV and LV Cable separation from control cabling philosophy. 2. Transportable Control Room HV and LV Switchroom and control room. 3. Fitment of buildings. 4. Control Room HV and LV. The following considerations have been made: ▸ For the East Kimberley, the fire segregation of the controls from the primary switchgear in the power station is not feasible. The power station is not operational fulltime and the assets are not suitable for remote configuration. Should a new power station be constructed, the segregation will be considered. ▸ For Port Hedland this action is not relevant as the two power stations will be replaced in the first quarter of 2010. ▸ For Carnarvon WA Transformers came to site to review necessary maintenance and forward overhauls for all switchgear in power station.	Completed	
5.4	▸ (10.b)Review the Carnarvon Power Station minimum diesel fuel stock holdings.	▸ Reviewed the Carnarvon PS minimum diesel fuel stock holdings and documented requirements. Procurement to keep the fuel tanks at a minimum of 200,000 litres during the summer period (Nov-Apr).	Completed	

AMS Element	Recommendations	Actions	Status	Further Actions
		Outside this period, levels are to be kept to a minimum level of 150,000 litres.		
6	**Asset Maintenance**			
6.1	▸ (11) Provide greater visibility to condition monitoring in the NSC Regional AMPs and link directly to asset risk registers to ensure asset maintenance/replacement programmes are given high priority in areas where unacceptable risks have been identified and recorded by Horizon Power or its agent(s).	▸ Maintenance Works Delivery Index created and endorsed by the Operations Management Team in March 2009 to Improve visibility of condition monitoring in performance review process . The index measures outstanding work orders and also outstanding pending severity 1 and 2 DFMS conditions. This measure is included in the Divisional and District balanced scorecards (Divisional Business report DMS# 3011062) which are reviewed at monthly performance review meetings at both the Divisional and District level. ▸ Clarified importance of two way link with the divisional risk register in Network Asset Management Master Plan. ▸ Created the roles of Power Systems Officers in the Operations Division Structure to focus specifically on maintenance. ▸ Maintenance Management Process is under review.	Completed	
6.2	▸ (12) Review the maintenance resource requirements of the Carnarvon Power Station 6.6kV Generator Switchgear, 22kV Distribution Switchgear and 6.6/22kV Transformers. Check other Horizon Power owned power station operations for appropriate levels of switchgear maintenance resourcing.	▸ Included power station switchgear in Ellipse Asset Register for Carnarvon, Nullagine, Marble Bar, Wyndham, Kununurra. Outstanding is Denham and Exmouth. The SAMP has the maintenance general criteria and refers the business to the requirements for having the data in Ellipse. Data used in the set up was obtained through site interviews, the previous MEX system and external reports on necessary maintenance and	Completed	

AMS Element	Recommendations	Actions	Status	Further Actions
		forward overhauls for all switchgear in power station. . Ellipse has been updated with the MSTs and Standard jobs for the power stations. Kununurra, Carnarvon, Marble Bar, Nullagine and Wyndham have the generation plant within the system and are under the management of the DOO's for the Districts		
7	**Asset Management Information Systems**			
7.1	▸ 13) HorizonPower considers investigating options to establish a platform of advanced network management, asset management and work management systems independent of Western Power as a contingency should the use of and support for the current MIMS Ellipse and ENMAC be withdrawn in the future.	▸ Developed contingency plan for asset management systems in case of withdrawal of WP's support for Ellipse and ENMAC. There is a 3 year separation program and transformation program managed by Geoff White in the Knowledge and Technology Division which will address this issue. Asset Strategy and Capability are working with Knowledge and Technology to ensure new systems are tailored to suit HP's requirements.	Completed strategy development.	Separation program is ongoing.
8	**Risk Management**			
8.1	▸ (14) Complete the Generation Risk Assessment; prepare the Risk Register and Risk Mitigation Plan.	▸ Conducted district risk workshops in all districts. All Generation risks have been identified and recorded in Cura under Operations domain - Operations Risk Assessments. All Generation risks have been reviewed by GM. Workshops to be repeated every 6 months.	Completed	
	▸ Secure the availability of emergency HV switchgear maintenance/repair resources for Carnarvon Power Station. Resources do not exist at present and risk to continuous operation is high.	▸ Developed contingency plan for Carnarvon PS switchgear, Daryl Wright followed up with WA Transformers and they have developed a maintenance and management plan for powerstation switchgear.		

AMS Element	Recommendations	Actions	Status	Further Actions
	▸ Prepare risk assessments and management plans for regional and district level systems, and include risks in the Risk Register.	▸ Clarified importance of two way link with the divisional risk register in Network Asset Management Master Plan. This has been included in the Distribution Strategic Asset Management Plan which is now complete.		
9	**Contingency Planning**			
9.1	▸ (15) Finalise and issue the NCS Regional/District Contingency Plans. ▸ Include Contingency Planning in the NCS AMPs. ▸ Regularly test the Contingency Plans.	▸ A contingency plan template has been prepared and contingency plans prepared. ▸ The SAMP includes section on contingency plan. District AMPs also include section on contingency plans. ▸ Contingency plans have been tested.	Completed	
9.2	▸ (15.3) Prepare Power Station Contingency Plans. ▸ Include Contingency Planning in the Generation AMP. ▸ Regularly test the Contingency Plans.	▸ All contingency plans have been prepared. The SAMP includes section on contingency plan. District AMPs also include section on contingency plans. ▸ Contingency plans have been tested.	Completed	
9.3	▸ (16) Review the N-1 contingency provision for 6.6/22kV transformers at Carnarvon Power Station.	▸ Reviewed the N-1 contingency provision for 6.6/22kV transformers at Carnarvon Power Station. WA Transformers have been on site to review equipment types and critical spares required. Analysis has been completed and it is confirmed there is n-1 contingency for the 09/10 expected summer loads. This is documented in DMS# 3197566.	Completed	

AMS Element	Recommendations	Actions	Status	Further Actions
12	**Review of AMS**			
12.1	▸ (17) Review and update asset management planning documentation including corporate policy, plans and procedures that were developed for Network Customer Services and Generation Services during the Horizon Power inception but have not been reviewed for the past two years. Some documentation remains in the Western Power livery and format.	▸ Asset management planning documentation including corporate policy and plans have been reviewed and updated. Procedures are being updated progressively. A Rebranding Western Power Field Instruction Manual Plan created to guide documentation identification and re-branding.	A program is in place and revisions are in progress. Action is deemed completed.	
12.2	▸ Special attention is required to achieve greater consistency with asset practical completion and hand over certificates. Field staff to be reminded of their adherence accountability to Horizon Power's five step Project Gating Process.	▸ The implementation of certificates of practical completion / sign-off by customer has been reviewed. Modifications have been implemented on relevant processes (DQM, new Subdivision process). Handover process has been included in the sub division handbook. Checklists in work parcels have been modified to include handover process. The process map and the gating framework have been presented to all relevant Distribution, Transmission and Generation staff.	Completed	
	Changes to the Licence			
13	▸ Delete the Power Stations included in the Licence that have been transferred to IPPs.	▸ Deleted the power stations included in the licence that have been transferred to the IPPs.	Completed	

Appendix C
Risk Assessment Matrix

REF NO.	ASSET MGT SYSTEM ELEMENT	REQUIREMENT	Risk Conseq. Rating	Likelihood Rating	Inherent Risk Rating	EXISTING CONTROLS	Adequacy of Existing Controls	Audit Priority	TESTS TO ASSESS COMPLIANCE / EFFECTIVENESS
			Min/Mod/Maj	Likely/Prob/Unlikely	Low/Med/High		Strong/Mod/Weak	1-High 5-Low	
1.0	**Asset Planning**	Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.							
1.1		Planning process and objectives reflect the need of all stake holders and is integrated with business planning.	Mod	Likely	High	Strategic Asset Management Plan (SAMP), Strategic Asset Management Plans: Transmission & Generation, Distribution, by District (DAMP); Strategic Development Plan 2008/09 to 2012/13 (SDP), Statement of Corporate Intent (SCI), Stakeholder Customer Satisfaction Surveys, Fit for Purpose Index, Distribution System Planning Studies	Strong	**2**	Review SAMP, DAMP; Customer Satisfaction Survey; Management Team Performance Review Meeting; Interview Asset Strategy Managers, District Business Managers & District Operations Officers
1.2		Service levels are defined.	Mod	Unlikely	Med	Asset & Work Strategy Group Proposal, SCI, Operations Balanced Scorecard, District Balanced Scorecard, License Obligations	Strong	4	Review SCI, SDP, SAMP; Scorecards; Interview Asset Strategy Managers
1.3		Non-asset options (eg. demand management) are considered.	Min	Unlikely	Low	SAMP; DAMP; Gating Framework	Weak	5	Review DAMP; Interview Asset Strategy Managers
1.4		Lifecycle costs of owning and operating assets are assessed.	Min	Probable	Low	SAMP (5.4); DAMP; Gating Framework, Business Cases, DQM, Project Implementation Plans	Strong	5	Review DAMP; Business cases
1.5		Funding options are evaluated.	Min	Unlikely	Low	SDP; DAMP; Project Implementation Plans; Business cases; 5 Years Capex Project List	Strong	5	Review SDP, DAMP; 5 Years Capex Project List
1.6		Costs are justified and cost drivers identified.	Min	Probable	Low	SDP, SAMP, DAMP; Gating Framework, DQM	Strong	5	Review SDP, DAMP
1.7		Likelihood and consequences of asset failure ar predicted.	Maj	Unlikely	High	Risk Management Policy; Risk Management Framework Manual; Risk Management Framework Matrix; Operations Risk Register; Half-Yearly District Risk Workshops; CURA	Strong	**2**	Review Risk Management Framework Manual and Matrix; Risk Management Risk Register results (DMS#3127206 Interview Manager Risk & Audit; Examine outcomes of risk workshops and control of data / actions within CURA
1.8		Plans are regularly reviewed and updated.	Mod	Probable	Med	SCI, SAMP, Operation Division Management Performance Review Meetings, CURA, DMS	Mod	4	Review SCI, SAMP, Management Review meeting minutes; Interview Asset Strategy Managers, Confirm document control in DMS & CURA
2.0	**Asset Creation and Acquisition**	A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.							
2.1		Full project evaluations are undertaken for new assets, including comparative assessment of non asset solutions.	Min	Unlikely	Low	DAMP; Gating Framework	Strong	5	Review DAMP, Business cases
2.2		Evaluations include all life-cycle costs.	Min	Probable	Low	Gating Framework; DQM	Mod	5	Review DAMP; Business Case Evaluations
2.3		Projects reflect sound engineering and business decisions.	Maj	Unlikely	High	Gating Framework, Engineering Procedures & Guidelines, Planning Criteria	Strong	**2**	Review Business Case Evaluations; Interview Asset Strategy Managers, District Business Managers & District Operations Officers; Observe outcomes are consistent with controls
2.4		Commissioning tests are documented and completed.	Mod	Unlikely	Med	SAMP; Specification templates; Inspection & Test Plans; Commissioning Templates; Project Files; DFMS; Ellipse; Distribution System Planning Studies; Asset Register	Strong	4	Review specifications; Interview Works Delivery Coordinators; Examine select DFMS / Ellipse records

REF NO.	ASSET MGT SYSTEM ELEMENT	REQUIREMENT	Risk Conseq. Rating	Likelihood Rating	Inherent Risk Rating	EXISTING CONTROLS	Adequacy of Existing Controls	Audit Priority	TESTS TO ASSESS COMPLIANCE / EFFECTIVENESS
			Min/Mod/Maj	Likely/Prob/Unlikely	Low/Med/High		Strong/Mod/Weak	1-High 5-Low	
2.5		Ongoing legal/environmental/safety obligations o the asset owner are assigned and understood.	Maj	Unlikely	High	SAMP; Organisational Structure & Responsibility; DAMP; Asset & Work Strategy Group Proposal; Monthly Management Meetings; Divisional, Regional & District Business Reports	Strong	2	Review job descriptions; SAMP; DAMP;; Interview Asset Strategy Managers, District Business Managers & District Operations Officers; Assess dissemination of legal/environmental/safety obligations and changes
3.0	**Asset Disposal**	Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.							
3.1		Under-utilised and under-performing assets are identified as part of a regular systematic review process.	Min	Likely	Med	DAMP; Operations Asset Disposal Procedure; Management Team Planning / Strategy Meeting, Asset Register	Weak	3	Review DAMP; Asset Register; Interview Asset Strategy Managers, District Business Managers & District Operations Officers; Minutes of Management Team Planning / Strategy Meeting
3.2		The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.	Mod	Likely	High	DAMP; Operations Asset Disposal Procedure; Risk Register	Weak	1	Review Management Review meeting records; DAMP; Interview Asset Strategy Managers, District Business Managers & District Operations Officers, Examine selection of recent asset disposals and assess against controls, Review measures / performance indicators of under utilisation / poor performance
3.3		Disposal alternatives are evaluated.	Min	Likely	Med	DAMP; Operations Asset Disposal Procedure	Mod	4	Review recent asset disposals; Interview Asset Strategy Managers, District Business Managers & District Operations Officers
3.4		There is a replacement strategy for assets.	Maj	Unlikely	High	SDP; 5 Year Capex Project List; Operations Asset Disposal Procedure; Distribution System Planning Studies; DAMP	Strong	2	Review SDP; 5 Year Capex Project List; Interview Asset Strategy Managers, District Business Managers & District Operations Officers
4.0	**Environmental Analysis**	The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain requirements.							
4.1		Opportunities and threats in the system environment are assessed.	Mod	Unlikely	Med	SCI; SDP; SAMP; DAMP; 5 Year Forecast Demand; Operations Risk Register; CURA; Strategic Development Plan	Mod	4	Review SCI; SDP; SAMP; Interview Asset Strategy Managers; Examine outcomes of risk workshops and control of data / actions within CURA
4.2		Performance standards (availability of service, capacity continuity, emergency response, etc) are measured and achieved.	Maj	Unlikely	High	Gating Framework; Operations Balanced Scorecard; District Balanced Scorecard; SCI; Network Quality and Reliability of Supply (NQR) Report (Annual) and Independent Audit	Strong	2	Review documentation including NQR Audit Report, Interview Management Systems and Business Efficiency Manager & District Business Managers
4.3		Compliance with statutory and regulatory requirements.	Maj	Unlikely	High	Electricity Licence Compliance Manual; Operations Asset Disposal Procedure; Environmental Policy; Monthly Management Meetings; SAFETRAC; NQR Report; Internal Audits	Strong	2	Review Report on Compliance with Licence; Management Performance Review Meetings records; Interview Technical Regulation Engineer & Asset Strategy Managers
4.4		Achievement of customer service levels.	Mod	Likely	High	Operations Risk Register; Operations Balanced Scorecard; District Balanced Scorecard; SCI; Stakeholder Customer Satisfaction Surveys	Strong	2	Review NQR Report and NQR Audit Report; Review SAMP, DAMP & SCI; Review Customer Satisfaction Surveys; Interview Management Systems and Business Efficiency Manager & Asset Strategy Managers
5.0	**Asset Operations**	Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.							
5.1		Operational policies and procedures are documented and linked to service levels required	Mod	Probable	Med	SAMP; DAMP; Operating Manuals	Mod	4	SAMP; DAMP; Interview Operations Contractors & District Operations Officers
5.2		Risk management is applied to prioritise operations tasks.	Mod	Probable	Med	SAMP; Operations Risk Register; CURA; Monthly Management Meetings; Job Planning and Hazard Identification Procedure (DMS 3041261); Job Risk Analysis Procedure; Toolbox meetings; Permit system	Strong	4	Review existing procedure application; Interview District Operations Officers & Manager Risk and Audit

REF NO.	ASSET MGT SYSTEM ELEMENT	REQUIREMENT	Risk Conseq. Rating	Likelihood Rating	Inherent Risk Rating	EXISTING CONTROLS	Adequacy of Existing Controls	Audit Priority	TESTS TO ASSESS COMPLIANCE / EFFECTIVENESS
			Min/Mod/Maj	Likely/Prob/Unlikely	Low/Med/High		Strong/Mod/Weak	1-High 5-Low	
5.3		Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical / structural condition and accounting data.	Maj	Unlikely	High	Asset Register; DFMS; Ellipse	Mod	2	Interview Works Delivery Coordinators; Select recent new asset acquisition / update and check DFMS / Ellipse records; Assess consistency across systems including financial
5.4		Operational costs are measured and monitored.	Mod	Unlikely	Med	DAMP; Ellipse	Strong	4	DAMP; Operation Cost Records; Interview Operations Contractors & District Operations Officers
5.5		Staff receive training commensurate to their responsibilities.	Maj	Unlikely	High	Training System Database, Training Manuals; Job statements; Performance reviews	Mod	2	Review training records; Staff competency records; Interview District Operations Officers
6.0	**Asset Maintenance**	Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.							
6.1		Maintenance policies and procedures are documented and linked to service levels required	Mod	Probable	Med	SAMP; Preventative Maintenance Policy; Maintenance Works Delivery Index; Ellipse, DFMS	Mod	4	Review procedures; Interview Operations Contractors & District Operations Officers
6.2		Regular inspections are undertaken of asset performance and condition.	Maj	Probable	High	SAMP; EAM System (Generation); Maintenance Criteria for Plant (Power Transformers, Steel Lattice Towers); Wood Pole Inspection Manual; Maintenance Works Delivery Index; DFMS; Ellipse	Strong	2	Review Maintenance Level application; Interview Operations Contractors & District Operations Officers; Sample DFMS / Ellipse records
6.3		Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule.	Maj	Likely	High	SAMP; DAMP; EAM; Emergency & Business Continuity Management System; Maintenance Works Delivery Index DFMS; Ellipse	Mod	2	Review maintenance records; Interview Operations Contractors & District Operations Officers; Sample DFMS / Ellipse records
6.4		Failures are analysed and operational/maintenance plans adjusted where necessary.	Maj	Unlikely	High	Fault Reporting Procedure; Incident Reporting Policy; CINTELLATE system; SAMP; DAMP	Strong	2	Interview Asset Strategy Managers; Check CINTELLATE records against procedures; Check DAMP and Maintenance Plans
6.5		Risk management is applied to prioritise maintenance tasks.	Maj	Unlikely	High	SAMP; Operations Risk Register; Half-Yearly District Risk Workshops; CURA; Job Planning and Hazard Identification Procedure (DMS 3041261); Job Risk Analysis Procedure;	Strong	2	Interview Operations Contractors & District Operations Officers, Check DFMS / Ellipse records & DRE entry of data
6.6		Maintenance costs are measured and monitored.	Min	Unlikely	Low	DQM, DFMS, Ellipse	Strong	5	DAMP and Budget Reports; Review job cost records
7.0	**Asset Management Information Systems**	The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.							
7.1		Adequate system documentation for users and IT operators.	Mod	Probable	Med	User Manuals; Corporate Intranet; Help Desk; Western Power SLA	Weak	3	Review system documentation; Interview IT Manager; Check IT system training records
7.2		Input controls include appropriate verification and validation of data entered into the system.	Mod	Likely	High	DRE	Mod	2	Interview District Operations Officers, Operations Contractors & SCADA Operators, Check forms / PDAs and built-in DRE validation; Equipment calibration and test records
7.3		Logical security access controls appear adequate, such as passwords.	Mod	Likely	High	Ellipse Global Profiles, New User Procedures	Mod	2	Review procedure; Interview IT Manager; Check IT system access
7.4		Physical security access controls appear adequate.	Mod	Unlikely	Med	Swipe Cards; Visitor Register	Mod	4	Review procedures; Observe security environment

REF NO.	ASSET MGT SYSTEM ELEMENT	REQUIREMENT	Risk Conseq. Rating	Likelihood Rating	Inherent Risk Rating	EXISTING CONTROLS	Adequacy of Existing Controls	Audit Priority	TESTS TO ASSESS COMPLIANCE / EFFECTIVENESS
			Min/Mod/Maj	Likely/Prob/Unlikely	Low/Med/High		Strong/Mod/Weak	1-High 5-Low	
7.5		Data backup procedures appear adequate.	Maj	Unlikely	High	SAMP; Western Power SLA	Mod	2	Interview IT Manager; Check location & currency of backups (on / offsite), Check restore procedures tested and documented
7.6		Key computations related to licensee performance reporting are materially accurate.	Mod	Probable	Med	External NQR Audit	Mod	4	Review External NQR Audit; Check verification / validation of data;
7.7		Management reports appear adequate for the licensee to monitor licence obligations.	Mod	Probable	Med	Monthly Management Meetings; Divisional, Regional & District Business Reports; Operations Balanced Scorecard; District Balanced Scorecard; SCI	Strong	4	Review management reports; Interview Management Systems and Business Efficiency Manager
8.0	**Risk Management**	An effective risk management framework is applied to manage risks related to the maintenance of service standards							
8.1		Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.	Maj	Probable	High	SAMP; Risk Management Framework; Half-Yearly District Risk Workshops; CURA;	Strong	2	Review risk management policies and procedures; Interview Manager Risk & Audit; Examine outcome of risk workshops and control of data actions within CURA
8.2		Risks are documented in a risk register and treatment plans are actioned and monitored.	Mod	Likely	High	Operations Risk Register; CURA	Strong	2	Review Risk Register and DAMPs; Interview Manager Risk & Audit; Examine outcomes of risk workshops and control of data / actions within CURA
8.3		The probability and consequences of asset failur are regularly assessed.	Mod	Probable	Med	Operations Risk Register; CURA; DAMP	Strong	4	Review DAMPs; Risk Registers; Risk Management Framework outcome and Workshops.
9.0	**Contingency Planning**	Contingency plans have been developed and tested to minimise any significant disruptions to service standards.							
9.1		Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	Maj	Probable	High	SAMP; Emergency & Business Continuity Management System and Plans	Strong	2	Review plans; Interview Asset Strategy Managers; Check for evidence of contingency plans being tested
10.0	**Financial Planning**	A financial plan that is reliable and provides for the long-term financial viability of the services.							
10.1		The financial plan states the financial objectives and strategies and actions to achieve the objectives.	Min	Unlikely	Low	Strategic Development Plan 2008/09 to 2012/13 (SDP); DAMP; 10yr Capital Investment Plan	Strong	5	Review plans
10.2		The financial plan identifies the source of funds for capital expenditure and recurrent costs.	Mod	Unlikely	Med	SDP; Business Cases; Project Implementation Plans	Strong	4	Review SDP
10.3		The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets).	Min	Unlikely	Low	SDP	Strong	5	Review SDP
10.4		The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period.	Min	Probable	Low	SDP; DAMP; 10yr Capital Investment Plan	Mod	5	Review plans
10.5		The financial plan provides for the operations an maintenance, administration and capital expenditure requirements of the services.	Mod	Unlikely	Med	Strategic Development Plan; Strategic Asset Management Plans – Transmission & Generation, Distribution, by District; 10yr Capital Investment Plan	Strong	4	Review SDP, DAMP
10.6		Significant variances in actual/budget income an expenses are identified and corrective action taken where necessary.	Mod	Unlikely	Med	Monthly Management Meetings; Divisional, Regional & District Business Reports; Board Meetings	Strong	4	Review Monthly Management Meeting records, Budget reports in plans

REF NO.	ASSET MGT SYSTEM ELEMENT	REQUIREMENT	Risk Conseq. Rating	Likelihood Rating	Inherent Risk Rating	EXISTING CONTROLS	Adequacy of Existing Controls	Audit Priority	TESTS TO ASSESS COMPLIANCE / EFFECTIVENESS
			Min/Mod/Maj	Likely/Prob/Unlikely	Low/Med/High		Strong/Mod/Weak	1-High 5-Low	
11.0	**Capital Expenditure Planning**	A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.							
11.1		There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	Mod	Probable	Med	SAMP; SDP; 10yr Capital Investment Plan; Transmission Capacity Plan; DAMP	Strong	4	Review SDP, Capital Investment Plan
11.2		The plan provide reasons for capital expenditure and timing of expenditure.	Mod	Unlikely	Med	SDP; 10yr Capital Investment Plan; DAMP	Strong	4	Review SDP, DAMP
11.3		The capital expenditure plan is consistent with th asset life and condition identified in the asset management plan.	Mod	Probable	Med	SDP; 10yr Capital Investment Plan; DAMP; Asset Register	Strong	4	Review SDP vs DAMP vs Asset Register
11.4		There is an adequate process to ensure that the capital expenditure plan is regularly updated an actioned.	Mod	Unlikely	Med	SAMP; Capital Budget Review procedure; DMS; CURA; Monthly Management Meetings; DOO Report on Expenditure and Progress (monthly)	Strong	4	Review SAMP, monthly reports and records
12.0	**Review of AMS**	Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.							
12.1		A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.	Min	Probable	Low	SAMP; DMS; CURA; Internal Audit Plan; External Audits; Management Team Planning / Strategy Meeting	Strong	5	Review Management Review meetings; CURA
12.2		Independent reviews (eg internal audit) are performed of the asset management system.	Min	Likely	Med	SAMP (2.3); Internal Audit Plan, GHD Asset Management Systems Review; Asset Filed Audit Survey (SAMP 5.73)	Strong	4	Review SAMP; Internal Audit schedule; Internal Audit records

ABBREVIATIONS

CURA, DFMS, DMS, DQM, DRE, EAM are Horizon Power Systems or identifiers.

DAMP	Strategic Asset Management Plans – Transmission & Generation, Distribution, by District
NQR	Network Quality and Reliability of Supply
SAMP	Strategic Asset Management Plans
SCI	Statement of Corporate Intent
SDP	Strategic Development Plan

Appendix D
Post Review Implementation Plan

HORIZON POWER ELECTRICITY LICENCE ASSET MANAGEMENT REVIEW

Post Review Implementation Plan

DMS#:3215054

Qualeng

Table 8: Post Review Implementation Plan

AMS Element	Recommendations	Actions	By Whom	Date
1	**Asset Planning**			
1.1	▸ Review requirements for planning studies and prepare planning studies for Hopetoun, Norseman and other required localities.	a.) Review system planning study requirements that identifies frequency of studies and study criteria in conjunction with system load growth. b.) Request planning studies for Hopetoun and Norseman.	Bill Bignell Scott Frazer	30/03/10 30/04/10
1.1	▸ Complete Distribution planning studies for Carnarvon and Kununurra.	a.) Complete Kununurra planning study. b.) Complete Carnarvon planning study.	Graham Vick Les Bardoe	12/04/10 12/04/10
1.1	▸ Complete Carnarvon and Esperance Generation District Asset Management Plans (DAMPs). Missing data and follow-up actions need to be tracked.	a.) Complete and have approved Carnarvon Generation DAMP. b.) Incorporate actions in DAMP into OAMPs. c.) Incorporate missing data into next iteration of Esperance Generation DAMP.	DOOG DOOG DOOG	31/05/10 31/05/10 31/05/10
1.1	▸ Complete Generation DAMPs to show compliance with the environmental analysis defined in section “Environmental Load Forecast” of the Transmission and Generation SAMP.	Incorporate environmental analysis into Asset Management Plan for Generation.	Robert Kerrigan	30/06/10
1.1, 1.8, 7.2	▸ Document control system should be improved to ensure compliance of format and content across all planning documents such as DAMPs. Identify document author, reviewer and approver consistently. Ensure DAMPs are clearly identified when in draft and when approved. ▸ Consider a more robust document management system for version/revision control, document dissemination to stakeholders and general quality control.	Investigate and implement new document control system for AM plans, which will be in line with the new DMS system currently in procurement by Knowledge and Technology.	Document Controller	28/02/11

AMS Element	Recommendations	Actions	By Whom	Date
	▸ Apply better version/revision control to ensure asset management plans follow one single development stream and no multiple versions exist.			
1.1, 1.8, 6.1, 7.2, 12.1	▸ A control should be in place for the verification of the DAMPs accuracy, completeness and suitability for approval.	Implement interim documentation control solution of Asset Management Documents to identify owner, version and approval status, pending above action.	Document Controller	31/05/10
1.1, 1.8, 11.4, 12.1	▸ Document and monitor update cycles for all key planning documents using CURA or equivalent control environment. ▸ Strengthen DAMP review control process by documenting deliverables and timeline for annual asset management planning documentation, disseminate responsibilities to districts and monitor due dates and status of preparation, review, approval, issue etc.	Implement AM plan cycle monthly status reporting that tracks progress against plan.	Robert Kerrigan	31/03/10
1.2, 4.4	▸ Continue to ensure that performance benchmarks are being achieved or corrective actions are being raised as appropriate to minimise low results.	Enhance the monthly asset management performance report and the initiation of any identified corrective actions.	Brett Hovingh	31/10/10
1.3	▸ Continue the demand side management trial leading to the development of guidance or methodology on the adopted approach.	Create formal procedure for demand site trials that identifies opportunities and success of trial.	Manus Higgins	31/12/10
1.4, 2.2	▸ Complete development of life cycle costing model. Ensure consistent application of life cycle costing model across organisation.	a.) Complete life cycle costing model. b.) Implement and evaluate effectiveness of life cycle model.	Robert Kerrigan Robert Kerrigan	21/02/10 30/09/10

AMS Element	Recommendations	Actions	By Whom	Date
1.7, 8.2	▸ Improve quality control over CURA data, remove duplication of risks from register, ensure all actions are allocated dates, responsible party and maintained current.	Update CURA actions with due dates and streamline actions where possible.	Phoebe Colman	31/03/10
2	**Asset Creation and Acquisition**			
2.4	▸ Strengthen the consistency of project completion and/or final inspection sign-off in accordance with forms in use.	Reinforce and review compliance of project sign off and final inspection.	MBOs	30/06/10
2.5	▸ [**OFI**] There may be scope for extending and better integrating the governance training system with other training areas of HP leading to a centralised training system.	HP are already in the process of implementing a central training system, therefore no action required.		
3	**Asset Disposal**			
3.2	▸ Document policy and/or procedure for the treatment of under-utilised and/or poorly performing assets.	a.) Create policy on management of under utilised assets. b.) Create procedure on identifying and investigating under utilised assets.	Bill Bignell Robert Kerrigan	30/12/10 30/06/11
4	**Environmental Analysis**			
4.2	▸ Confirm sufficient data being received from all IPP sites to measure compliance and document/report formally IPP performance. Obtain documentation on IPP contingency plans. Consider use of non- conformance reports to deal with IPP failures.	a.) Review and improve IPP performance data collation and include in monthly reports. b.) Include IPP performance data in DAMP template. c.) Consider and implement IPP non conformance reports if required. d.) Obtain copies of IPP contingency plans	Kevin Carey Robert Kerrigan Atul Garg Atul Garg	31/05/10 28/04/10 30/06/10 30/06/10

AMS Element	Recommendations	Actions	By Whom	Date
4.2	▸ [**OFI**] Investigate the feasibility of placing back to back responsibility on the IPPs in future Service Level Agreements for compliance with the regulatory requirements.	Enhance new IPP PPAs to include regulatory compliance.	Atul Garg	30/04/10
4.2	▸ [**OFI**] Consider adding contingency/emergency response measures to the balanced scorecard.	Consider Including contingency performance/trials on balanced scorecard.	Phoebe Colman	31/05/10
5	**Asset Operations**			
5.1	▸ Ensure site manuals are kept up to date.	a.) Review and enhance site emergency manuals. b.) Update Wyndham site emergency manuals. c.) Continuous review of manuals to be undertaken in conjunction with implementation of the Electricity Safety Case.	DBMs Tony Lister Document Controller	30/06/10 31/03/10 01/12/10
5.1	▸ Continue with documentation of procedures for HPCC activities, including a procedure for the verification of fault reports.	Develop a plan for the completion of HPCC documentation and monitor progress against it, with a plan finalising a completion date.	Alf Martin	30/07/10
5.3	▸ Complete measures to streamline and integrate various 'Asset Register' systems.	Complete business case for amalgamation of asset registers.	Bill Bignell	31/10/10
5.3	▸ Complete project to update data associated with asset age profiles.	Complete the data verification project.	Nia Nguyen	30/04/10
5.3, 7.2	▸ Program to verify and correct inaccurate data in asset registers should be continued and completed. While resources have been allocated to correct the data, there is a need to better quantify the task and resource requirements.	Network maintenance management interim instruction issued 06/11/09 that targets data correctly aligned with next inspection cycle. A more detailed instruction to be issued in 2010.	Brett Hovingh	30/06/10

AMS Element	Recommendations	Actions	By Whom	Date
5.5	▸ Proceed with consolidation of training records and training system.	HP have already commenced implementation of a central training register, therefore this action is not required.		
5.5	▸ Document training needs and program for HPCC staff.	Review and enhance the HPCC training competency program modules that provide assurance of competencies for both existing and future Controllers.	Shane Eeles/Paul Elliott	30/11/10
5.5	▸ Record training attendance and competency requirements for staff in HPCC.	Track HPCC staff employees progression against competencies.	Alf Martin	30/06/11
6	**Asset Maintenance**			
6.2	▸ Confirm that all inspection plans are being carried out as scheduled including transmission and substation inspection. Reports and data on transmission assets, including substation inspection and status of the assets should be made available to the respective district management.	a.) Develop inspection reporting that includes transmission substation inspections in accordance with maintenance schedule b.) Develop substation maintenance schedule for each district for their reference.	Kevin Carey Wayne Karslake	31/05/10 31/05/10
6.2	▸ Document requirements for Quality Assurance/Auditing inspections for wood pole maintenance in asset management plans. ▸ Plan and carry out QA inspections in a timely fashion.	a.) Develop wood pole inspection QA requirements. b.) Implement wood pole inspection QA.	Nia Nguyen Scott Frazer/Les Bardoe	30/06/10 31/07/10
6.2	▸ Implement consistent completion and/or final inspection sign-off.	Implement final inspection sign off.	DOOs	31/07/10
6.4	▸ Recording and management of non-safety related incidents should be implemented using CINTELLATE or similar system.	Develop a system for tracking non run to fail asset failures that identifies root cause and areas of improvement.	Robert Kerrigan	31/05/10

AMS Element	Recommendations	Actions	By Whom	Date
6.4	▸ [**OFI**] Where applicable there should be more in depth analysis of main contributors to low reliability figures for assets.	a.) Enhance fault case reporting analysis in DAMP template. b.) Review TCS capabilities to identify and record asset type failure to determine which system will become Horizon Power's asset failure database.	Robert Kerrigan Paul Elliott	30/04/10 30/04/10
7	**Asset Management Information Systems**			
7.1	▸ With introduction of new systems review/upgrade IT system documentation and training requirements.	Incorporate into transformation scope of work requirements to prepare system documentation, training documentation and update system architecture documentation.	Geoff White	30/06/10
7.2	▸ DFMS system lacks a facility to store historical data. If new data is entered in error previous data cannot be viewed or restored. There should be consideration of a facility to view the asset historical records and recover from errors.	As part of the IT Separation Programme add to DFMS replacement specification a requirement for historical asset data review, to be fully implemented, subject to funding, by 30/06/12.	Brett Hovingh	30/06/10
7.4	▸ Re-visit and apply physical security/access restrictions to Esperance depot.	Review, reinforcement and monitoring of current Esperance security access restriction protocols, including repairing the operations yard electronic access gate. There will be a new Esperance depot constructed in 2011/12, and security requirements will be enhanced then.	Layton Baker	31/05/10
7.4	▸ [**OFI**] Consider improvement in safety/visitor induction procedures for Esperance office/depot.	Standardise depot inductions across all 6 district sites.	Heather Jarvis	30/06/10
7.5	▸ Confirm and maintain test records for data backup and restoration across all systems/databases.	Backup tapes are tested on a regular basis through the provision of file restores at the request of end users. Records for these restores are maintained in the HP OpenView Service Desk application. Given the frequency of these requests (approximately 2 -5 per week) and the random nature of the time HP are required to restore from, we feel that the backup tapes are being adequately tested. No further action is required.		

AMS Element	Recommendations	Actions	By Whom	Date
7.5	▸ Document procedure for restoration of IT systems to minimise down time. ▸ Educate personnel on restoration procedures.	a.) Risk and Audit group is currently conducting a Business Impact Analysis of the existing IT restoration procedures to determine HP's tolerance for the loss of key systems. b.) Knowledge and Technology group will conduct an assessment of current IT recovery solution against the Business Impact Analysis results to identify potential gaps and initiate improvement projects.	Liang Tay	31/01/10
7.6	▸ [**OFI**] There may be an opportunity for improvement in documenting the method for monitoring and verifying fault data entry.	This action is not required as HP has introduced a new trouble call system (TCS) which requires fault verification to be undertaken by the asset owner on a weekly basis.		
8	**Risk Management**			
8.1	▸ [**OFI**] Consider evaluation of internal risks such as loss of key specialists in the organisation, loss of corporate systems (CURA etc.).	HP does consider internal risks and these are included on the Horizon Power risk register (as distinct from the Operations risk register) as some of these issues are HP-wide and not just owned by Operations. I.e. Loss of IT systems is on our top risk register, as is staff retention. No further action required.		
8.2	▸ [**OFI**] Link risks from Risk Register to DAMPs (improve transparency).	Incorporate risk numbers into DAMPs when requesting a new risk audit or new capital projects.	DOOs/Rob Kerrigan	31/05/10
9	**Contingency Planning**			
9.1	▸ Finalise and issue District Contingency Plans.	Update district contingency plans to new format.	DBMs	28/05/10
9.1	▸ Identify and document specific contingency procedures in district contingency plans, for example, Carnarvon Generation plan should include the response plan for the loss of PLC software.	Incorporate into district network contingency plans template generation assets and specific power station systems contingencies or substation controls.	Paul Elliott	30/06/10

AMS Element	Recommendations	Actions	By Whom	Date
9.1	▸ Effective management of testing of emergency procedures is recommended. Review of emergency response and recording of debrief sessions and improvement action should be carried out in accordance with the procedures, alternatively procedures should be reviewed and revised if necessary. Similarly for testing of evacuation procedure.	a.) Schedule annual depot emergency evacuation test, conduct debrief review of performance and implement identified improvement actions. b.) Schedule annual desktop asset contingency trial, conduct debrief review of performance and implement identified improvement actions.	DBMs DBMs	31/03/10 31/07/10
9.1	▸ There is a need to include in each district plan, a clear strategy on how a loss of IPP supplies will be managed and to identify where, when, how and to what extent alternatives will be available.	Include loss of IPP supplies in contingency plan template.	Paul Elliott	30/06/10
10	**Financial Planning**			
10.6	▸ **[OFI]** Review the use of existing project variance documentation.	Enhance compliance to variation processes and reintroduce procedure.	MBOs	31/05/10
11	**Capital Expenditure Planning**			
11.1	▸ Complete operations management plans for each district.	Complete and finalise OAMPs in line with the annual planning cycle.	DBMs	30/06/10
12	**Review of AMS**			
12.1	Recommendation included in 1.1 Asset Planning.			

Appendix E
Field Visits

APPENDIX E: FIELD VISITS

To assess the compliance of HP asset management system, field visits were included in the the review plan. The scope of the field work was proposed by Qualeng and then approved (with changes) by the Authority to include the following depots and districts:

1. Karratha depot, West Pilbara district,
2. Carnarvon depot, Gascoyne district,
3. Kununurra depot and Wyndham, East Kimberley district,
4. Esperance depot, Esperance district.

Findings and recommendations arising from the site visits have been included in the body of the report. The table below provides details of visits timeline and staff interviewed:

Table 9: Field Visits

Location	Dates Visited	Criteria
Karratha	21-23 September 2009	• Glenda Teede, DBM • Alan Porter, DOO Distribution • Wayne Karslake, DOO Transmission • Maurice Ryan, WDC Transmission • Alf Martin, Superintendent HPCC • Phoebe Colman, Manager Management Systems and Business Efficiency
Carnarvon	24-25 September 2009	• Mark Bruce, DBM • John Wilson, DOO Distribution • Daryl Wright, DOO Generation • Barry Saunders, WDC Generation • Neil Streatfield, WDC Distribution • David Shelton, CCRM • Jim Stent, safety representative
Kununurra and Wyndham	30 September - 2 October 2009	• Tony Lister, DBM • Graham Vick, DOO • Garry Hine, Contractor, Wyndham
Esperance	5-6 October 2009	• Layton Baker, DBM • Scott Frazer, DOO • Ken Bracknell, MPSO • Mal Smithies, WDC

Where:

DBM = District Business Manager

POST REVIEW IMPLEMENTATION PLAN

DOO = District Operations Officer
WDC = Works Delivery Coordinator
CCRM= Community and Customer Relations Manager
MPSO= Power Systems Officer, Maintenance